DOCUMENT RESUME

ED 342 283 HE 023 190

AUTHOR	Nicolae, Valentin; And Others
TITLE	Statistics on Higher Education. 1980-1985: A Study of Data on Higher Education and Research from the Countries of the Europe Region.
INSTITUTION	United Nations Educational, Scientific, and Cultural Organization, Bucharest (Romania). European Centre for Higher Education.
REPORT NO	ISBN-92-9069-112-3
PUB DATE	89
NOTE	189p.
AVAILABLE FROM	CEPES Pouch, UNESCO, 7 Place de Fontenoy, 75700 Paris, France ($10.00).
PUB TYPE	Reports - Research/Technical (143) -- Statistical Data (110)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	College Faculty; College Students; Demography; *Educational Development; Educational Finance; Educational Improvement; Enrollment Trends; Foreign Countries; Foreign Students; Higher Education; *Research and Development; Statistical Data; Student Characteristics
IDENTIFIERS	*Europe

ABSTRACT

A statistical evaluation of higher education in Europe for the years 1980-1985 is presented with a synoptic view of the strategies and policies adopted by member states in development of their higher education systems. The extensive tabular and narrative data are presented in nine chapters divided into two parts--Part I on higher education in the Europe region during this period, and Part II on research and experimental development (R & D) in Europe during this period. Chapters have the following titles: (1) "Higher Education in the Context of Demographic Evolution"; (2) "Evolution in the Structure of Student Enrollment"; (3) "Foreign Students Enrolled in the Countries of the Europe Region; (4) "Statistical Data on Higher Education Graduates"; (5) Higher Education Teaching Staff and Student/Teacher Ratio"; (6) "Expenditure on Higher Education"; (7) Research and Experimental Development (R & D) in the Context of Higher Education"; (8) "Human Resources Engaged in R & D"; (9) "The Expenditure for R & D." Contains 19 references in Part I and 10 references in Part II. (SM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED342283

UNESCO

STATISTICS ON HIGHER EDUCATION

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY
European Centre
for Higher Education
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

1980–1985: A STUDY OF DATA ON HIGHER EDUCATION AND RESEARCH FROM THE COUNTRIES OF THE EUROPE REGION

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

HE 023 190

PUBLISHED BY
EUROPEAN CENTRE FOR HIGHER EDUCATION

CEPES

UNESCO

STATISTICS ON HIGHER EDUCATION

1980—1985: A Study of Data on Higher Education and Research from the Countries of the Europe Region

Valentin NICOLAE
René H. M. SMULDERS
and
Mihai KORKA

Published by
European Centre for Higher Education—CEPES
Bucharest, 1989

ISBN 92 — 9069 — 112 — 3

TABLE OF CONTENTS

Foreword 5

PART I

HIGHER EDUCATION IN THE EUROPE REGION: 1980–1985

Explanatory Notes 7

1. HIGHER EDUCATION IN THE CONTEXT OF DEMOGRAPHIC EVOLUTION 9

1.1 Number of pupils and students 9
1.2 Proportion of pupils and students in the total population 12
1.3 Total number of students in higher education 15
1.4 Number of students per 100,000 inhabitants 19
1.5 Number of national students per 100,000 inhabitants 21

2. EVOLUTION IN THE STRUCTURE OF STUDENT ENROLMENT 25

2.1 Distribution of student enrolment by International Standard Classification of Education (ISCED) levels 25
2.2. Structure of student enrolment by fields of study 29
2.3 Student distribution by levels and fields of study 38
2.4 Proportion of female students in each country's total number of students 51
2.5 Proportion of female students in the total number of students at each level of higher education 54
2.6 Distribution of female students by levels of higher education 55
2.7 Distribution of female students by groups of fields or programmes of study 57
2.8 Part-time students 59

3. FOREIGN STUDENTS ENROLLED IN THE COUNTRIES OF THE EUROPE REGION 67

3.1 Foreign students received in the countries of the Europe Region in proportion to the total student enrolment 67
3.2 Evolution of the number of foreign student enrolment in the countries of the Europe Region 69

3.3 Distribution of foreign students trained in the countries of the Europe Region by zone of origin 71
3.4 Distribution of foreign students by country of origin in the Europe Region 76

4. STATISTICAL DATA ON HIGHER EDUCATION GRADUATES 82
4.1 Evolution of the number of graduates 82
4.2 Distribution of graduates by ISCED levels 84
4.3 Distribution of graduates by fields of studies 86
4.4 Proportion of female graduates 88

5. HIGHER EDUCATION TEACHING STAFF AND STUDENT/TEACHER RATIO 92

6. EXPENDITURE ON HIGHER EDUCATION 95

*

REFERENCES 102

PART II

RESEARCH AND EXPERIMENTAL DEVELOPMENT IN THE EUROPE REGION: 1980--1985

7. RESEARCH AND EXPERIMENTAL DEVELOPMENT (R & D) IN THE CONTEXT OF HIGHER EDUCATION 103
7.1 Aims of a statistical study on R & D 103
7.2 Organisation and management of R & D inside and outside higher education 105
7.3 Terms of reference 108
7.4 Reliability of data 109

8. HUMAN RESOURCES ENGAGED IN R & D 111
8.1 Number of personnel engaged in R & D 111
8.2 Scientific and technical manpower potential 114
8.3 Scientists and engineers engaged in R & D 117
8.4 Scientists and engineers in R & D by field of study 121
8.5 Scientists and engineers in R & D by sector of performance 122
8.6 The higher education sector engaged in R & D 127

9. THE EXPENDITURE FOR R & D 132
9.1 Total expenditure for R & D 132
9.2 Expenditure for R & D as a percentage of the gross national product 136
9.3 Expenditure for R & D by source of funds 139
9.4 Expenditure for R & D by sector of performance 142
9.5 Expenditure for R & D in the higher education sector 147

*

STATISTICAL ANNEXES 150

*

REFERENCES 164

FOREWORD

The rapid changes which have occurred in higher education during the last decades have turned post-secondary education into the most dynamic of educational sectors. This is true of the world as a whole, but more particularly of the countries of the Europe Region. In order to follow the development of higher education in Europe, CEPES has undertaken periodical studies and monographs, focussed primarily on the key indicators of current and future trends, and on those aspects which are considered to offer a broad overview of the field. The result was a series of statistical studies on higher education initiated by CEPES already in 1976. The first volume appeared in 1976 and covered the 1972—1973 period. It was followed by a similar study, published in 1978, covering a five-year period: 1970—1975. Both policy makers and researchers on higher education found the two studies useful and urged CEPES to continue the series.

The statistical studies by CEPES which were to follow were expected to cover five-year periods. Moreover, the statistical evaluations of the key indicators were to be supplemented by a broader examination of the contexts in which national systems of higher education function. Consequently, the third study in this series, which was published in 1983 and covered the 1975—1980 period, was entitled Higher Education and Economic Development in Europe. *It placed higher education within the broader context of national economic development by relating data on higher education to trends in demographic and economic development in Europe.*

The present study, which is part of the same series, continues the statistical evaluation of higher education in Europe for the 1980—1985 period. It offers a synoptic view of the strategies and the policies adopted by member states in the development of their higher education systems. Longitudinal and comparative statistical analyses and the identification of possible shifts in development trends are thus facilitated.

The originality of this volume resides in its second part which provides a statistical analysis of research and development (R & D) in the context of higher education.

The assumption is that no picture of higher education is complete, unless it includes all of its basic functions: teaching, training, and research. A Study on Higher Education and Research *published by CEPES in 1986 argues this case. Following that study and a specific recommendation of the CEPES Advisory Committee, the decision was taken to introduce, in the Centre's series of statistical studies, a separate section devoted to the statistical analysis of R & D in higher* *education. For that purpose, in 1987, CEPES engaged two researchers, Professor Klaus Hüfner of the Free University of Berlin and Professor Stefan Kwiatkowski of the Institute for Science Policy and Higher Education of Warsaw, to elaborate a comparative survey of national policies regarding the organisation, the status and the management of research inside and outside higher education. The remarks and conclusions of this survey have been included in the present study.*

CEPES wishes to thank all those who have provided assistance in the elaboration of this study, in particular, to the Unesco Office of Statistics. In fact, the guidelines and principles of elaboration of the study were discussed at an international experts' consultation on the application of the International Standard Classification of Education (ISCED) to programmes of education at the third level, which CEPES organised, in co-operation with this Office, in June 1987.

The authors of the study are Professor Valentin Nicolae of the Academy of Economic Studies of Bucharest, who elaborated Part I of the study (Higher Education in the Europe Region, 1980–1985), and Dr. René Smulders, Head of the Department of Statistics of Education of Voorburg, the Netherlands, and Dr. Mihai Korka of the Academy of Economic Studies of Bucharest, who shared among themselves the elaboration of Part II (Research and Experimental Development in the Europe Region 1980–1985).

Professor Valentin Nicolae, an expert on educational planning, has held positions which have enabled him to acquire a thorough knowledge of higher education and its role in society. He has served for several years as editor-in-chief and director of the Romanian periodical Forum, *which is devoted to higher education in Romania.*

Dr. René Smulders has been engaged in comparative statistical research on education for many years and has participated in numerous international meetings as an expert on educational statistics.

Dr. Mihai Korka is a specialist in international statistics. His contribution to the volume consisted in the inclusion of the findings of the Hüfner–Kwiatkowski survey mentioned above, and in updating the analysis of R & D in higher education on the basis of more recent data obtained from Unesco (latest available data used in the volume are dated July 1988).

Professor Dumitru Chiţoran, programme specialist of CEPES, has taken a most active part in the elaboration of this study and has been involved both in the drawind up of the outlines and in the editing. His substantial input was crucial to its finalisation.

CEPES is indebted to Miss Angela Clark, MA, University of London, and to Mr. Leland Barrows of the CEPES staff for the linguistic editing.

Since the Centre intends to continue its series of statistical studies, comments on this book and suggestions as to how the series can be improved are welcome.

CARIN BERG
Director

Part I

Higher Education in the Europe Region: 1980—1985

EXPLANATORY NOTES

The data in this study refer to the countries of the Europe Region (in the sense agreed upon by Unesco): Albania, Austria, Belgium, Bulgaria, Canada, Cyprus, Czechoslovakia, Denmark, Finland, France, the German Democratic Republic (GDR), the Federal Republic of Germany (FRG), Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxemburg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, the USSR, the United Kingdom, the United States of America, and Yugoslavia.

Data referring to the GDR and to the FRG also include the relevant data for West and East Berlin, respectively, which were not supplied separately, this without prejudice to any question of status which may be involved. The data referring specifically to the Byelorussian and the Ukrainian Soviet Socialist Republics are included in the data for the USSR.

The content of this study is based mainly on information derived from the following sources: the *Unesco Statistical Yearbook* (of the relevant years); current Unesco statistical surveys and research projects; information supplied by the Office of Statistics of Unesco and data presented in studies compiled under the aegis of CEPES, the European Centre for Higher Education. Use has also been made of monographs, national and international statistical studies, and bulletins, as well as of other sources which are acknowledged in the *References*. When data in the relevant issues of the statistical yearbooks varied, the most recent data have been employed.

Throughout the study, we have relied upon the data according to the International Standard Classification of Education (ISCED), established by Unesco. Moreover, we have taken into consideration the conclusions of the experts' consultation on the application of ISCED to programmes of education at the third level in countries of the Europe Region, which was organised by CEPES and held in Bucharest, from 11 to 13 May, 1987.

Higher (tertiary) education is the focal point of this study. According to ISCED, it comprises: level-5 education, leading to diplomas which are not equivalent to a first university degree; level-6 education, leading to a first university degree or to an equivalent diploma; and level-7 education, leading to a higher university degree or an equivalent diploma, based on further specialisation which extends and reinforces studies completed at level 6.

Higher education is further analysed by fields of study. ISCED distinguishes 18 fields. However, depending on the social and economic peculiarities of the countries involved, they may not all be presented in each case. Consideration has also been given to full-time and part-time courses, particularly to correspondence courses; to the distribution of male and female students, and also to other criteria.

Since ISCED is based on structures pertaining to the educational systems characteristic of the majority of the countries, it may not reflect the specific conditions prevailing in each country. In such particular cases, mention is made of the countries in question in either the text or in the notes * attached to the tables, the latter being generally intended to facilitate understanding of the matters in question. In citing particular cases, our aim has been to relate the data supplied by the respective national authorities more closely to the ISCED structure, thereby rendering the data more nearly complete.

---

* Throughout the survey, reference is made to the base year and to the last year of data: these refer to the first year for which data were available during the period under examination and to the last year of available data, respectively.

1. HIGHER EDUCATION IN THE CONTEXT OF DEMOGRAPHIC EVOLUTION

1.1 Number of pupils and students

Higher education is an integral part of the educational system of any country. It would be useful, therefore, to begin this statistical study of higher education with a brief outline of the entire educational system, which comprises: education preceding the first level (kindergartens, pre-nursery and nursery schools, etc.); level-one education (primary); level-two education (secondary -- usually composed of two stages often called gymnasium and lyceum education, respectively) and level-three education, (tertiary — generally known as higher education). In statistical terms, the analysis of education at its different levels projects the image of a *pyramid*, with education preceding the first level taken as the baseline and higher education taken as the apex.

Considering the broad variety of organisational forms existing in education in various countries today, priority has been given to the statistical information ordered and processed in accordance with the International Standard Classification of Education (ISCED). Thus:

a) *education preceding the first level* is received by three, four or five year-old children (sometimes they may be older), usually lasts from 1 to 3 years and may be held in public or private establishments;

b) *level-one education* — similarly public or private — begins when children are five, six or seven years old (with a few exceptions when it may begin at the age of four or eight years, respectively), lasts for four, five or six years (and sometimes longer) and does not, as a rule, include handicapped children. This study does not refer to special classes at level one intended for adults, given the lack of statistical data;

c) *level-two education* includes classes of general, teacher-training, technical and vocational education, which are held in both public and private schools. In most cases, data include both full-time and part-time education. In several countries, level-two education is in the process of being restructured, in order to ensure that secondary schools provide both general and occupational training;

d) ***higher education (tertiary)*** is composed of university or equivalent level establishments (levels 6 and 7 in the ISCED Classification) as well as by other institutions of higher education (corresponding to level 5). The figures included in this category relate to students registered at both public and private higher education establishments. As far as possible, the data include both full-time and part-time students. As a rule, external students have not been included, except for cases in which their educational level has been accepted as tertiary and they get the same, or equivalent degrees as the internal student.

We may encounter a number of difficulties in the structure, enumeration and comparison of the statistical data referring to education, given the specific situations in certain countries, which may have emerged as the result of various causes: the close links between national or local establishments and certain areas of education (religion, law, etc.); the relative importance of diverse social and economic factors which bear an influence, in various countries, on the choice of vocation and the consequent type of instruction (e.g. the predominance of agriculture, of mining, of the tertiary sector, etc.); the differences in the historical evolution and the general level of education in various countries (the problem of more or less widespread illiteracy, the development of higher education as related to education at other levels, etc.); the particular characteristics associated with the organisation of education depending on whether the State is unitary or federal and, furthermore, on the degree of autonomy enjoyed by the local authorities in regulating educational issues or in funding education.

Under such circumstances, despite the attempts to "universalize" ISCED and the progress made by national statistical bodies to comply with Unesco's request for the submission of transnationally comparable (inter-state) data, this objective has only been partly attained; therefore, any such comparisons should be made with caution. Nonetheless, as statisticians are only too aware, there are in practice no "pure" data, which are fully comparable in any field of activity; however, this does not prevent scientists as well as decision-makers from relying on statistics as indispensable work tools. As such, we have endeavoured to make the best use of available statistical data for this study, while, at the same time, making due specifications and reservations, if and when necessary.

Bearing the above in mind, an initial analysis of the *evolution of the total number of pupils and students* (including those children included in education preceding the first level) is essential.

At world and regional levels, as well as at the level of other large geographical areas, approximate calculations would indicate that the total number of pupils and students increased during the period under analysis as follows:

	Number of pupils and students (in millions)		Percentage evolution	Proportion of total population		Distribution by zone, in %	
	1980	1985	1985/1980	1980	1985	1980	1985
World total	898.0	959.6	107	20.4	20.1	100.0	100.0
— Africa	76.4	90.2	118	17.0	17.3	8.5	9.4
— America, North	98.8	104.1	105	26.5	26.0	11.0	10.9
— America, South	58.1	67.3	116	24.2	25.1	6.5	7.0
— Asia	497.0	528.7	106	19.4	19.0	55.3	55.1
— Europe	105.3	103.6	98	21.7	21.1	11.7	10.8
— Oceania	5.0	5.1	102	21.8	20.4	0.6	0.5
— USSR	57.4	60.6	106	21.6	21.7	6.4	6.3
Europe Region	237.3	241.4	102	22.6	20.1	26.4	25.2

There were no available data for the following countries: Namibia, South Africa, Western Sahara, Greenland, Democratic Kampuchia, East Timor, the Democratic People's Republic of Korea, Feroe Islands, Holy See, and Liechtenstein. The total population of these countries was approximately 55 million in 1980, i.e. 1.2% of the world total population, and approximately 62 million in 1985, i.e. 1.3% of the world total population. Despite the circumstances, the proportions and evaluations above are sufficiently representative to provide an overall picture of the Europe Region in a global context.

Regarding the countries of the Europe Region the data was collated most rigorously; however, the lack of certain information for 1985, especially concerning education prior to the first level, but at times also extending to other strata of the pyramid of education, results in the fact that information may not necessarily relate to the same time interval for all countries presented. Consequently, it has been considered more significant to employ *average annual rates* to illustrate the evolution of the total number of pupils and students, as duration phenomena.

In Table 1.1. below, we can observe an increase in the number of pupils and students in 22 countries and a decrease in 11 countries of the Europe Region.

Table 1.1.

The evolution of the total number of pupils and students in the countries of the Europe Region

(%)

Country	Period	Average annual rate	Country	Period	Average annual rate
Turkey	1981—1983	5.5	Norway	1980—1984	0.4
Malta	1980—1984	3.5	France	1980—1984	0.3
Israel	1980—1984	2.7	Finland	1980—1985	0.1
Cyprus	1980—1985	1.5	United States	1980—1985	0.0
Ireland	1980—1984	1.5	Sweden	1980—1984	−0.1
Luxemburg	1980—1983	1.5	Belgium	1980—1985	−0.6
Canada	1980—1985	1.4	Denmark	1980—1984	−0.7
Hungary	1980—1985	1.4	German Dem. Rep.	1980—1985	−1.0
Portugal	1980—1983	1.4	Austria	1980—1985	−1.1
Romania	1980—1985	1.3	Netherlands	1980—1984	−1.2
Greece	1980—1983	1.3	Italy	1980—1984	−1.3
USSR	1980—1985	1.1	Switzerland	1980—1985	−1.7
Bulgaria	1980—1985	1.1	United Kingdom	1980—1984	−2.1
Poland	1980—1985	1.0	Germany, Fed. Rep. of	1980—1984	−2.4
Albania	1980—1985	0.7	Yugoslavia	1980—1983	−4.3
Czechoslovakia	1980—1985	0.5			
Iceland	1980—1985	0.4			

Source: *Unesco Statistical Yearbook* — 1983, 1986, 1987.
Note: 0.0 — Variation less than 0.1.

The evolution of the total number of pupils and students is affected, on the one hand, by the dynamics of the demographic process, which bear a decisive influence on the number of children and teenagers included in pre-level-one education and compulsory general education; this in turn produces similar trends in the total number of pupils and students. On the other hand, the evolution is further affected by the socio-economic demand for labour, which may fluctuate in number and structure, as well as by the resources made available for education, which are reflected in the educational policies of the countries under analysis and in the choices made by the younger generation for certain types of schools and levels of training.

In connection with Table 1.1., the following points should be made:

— the data for Cyprus do not include the schools of the Turkish population;

— the data for pupils in Belgium, Finland and the United States of America do not include special education;

— in the GDR, after 1982, and in the FRG, after 1983, changes in classification have occurred regarding the inclusion of some classes in the first or in the second level of education, respectively. For this reason, the data for these two levels are no longer comparable with those of the previous years. This does not affect, however, the computation of the total number of pupils and students, irrespective of the year;

— furtherhore, for the GDR, the number of students also includes those in the preparatory classes for higher education, the extended secondary schools (also included in secondary education) and vocational education, including those students preparing for an entrance examination to university;

— for Romania, as from 1981, the figure given for secondary education includes those enrolled in part-time courses and correspondence courses;

— the total number of students for France is probably overestimated, as a number of the students enrolled at establishments considered as non-university („classes préparatoires aux grandes écoles" and „sections de techniciens supérieurs") are also registered at universities, therefore no exact figures can be supplied;

— the data relating to higher education in Luxemburg must be considered bearing in mind the fact that most young people of that country receive their higher education in Austria, Belgium, France, the FRG or in Switzerland.

1.2 Proportion of pupils and students in the total population

The proportion of pupils and students in the total population of each country, for the last year of available data (as in Table 1.1.), gives us the following percentages, in decreasing order: Israel 31.8, Albania 28.8; Ireland 27.4; Iceland 25.7; Spain 25.3; the United States of America 24.8; Romania 24.6; Canada 24.5; France 24.1; the Netherlands 23.1; Norway 22.3; Belgium 22.1; the USSR 21.7; the GDR 21.6; Bulgaria 21.5; Poland 21.4; Italy 21.2; Czechoslovakia 21.1; Hungary 21.1; Denmark 21.0; Finland 20.8; Sweden 20.4; Greece 20.2; Turkey 19.8; Malta 10.2; Portugal 19.1; the United Kingdom 18.9; Austria 18.1; the FRG 17.9; Yugoslavia 17.6; Cyprus 17.6; Luxemburg 16.1; Switzerland 16.1.

It is also important to establish how these proportions evolve in the period under analysis: increases or decreases and their dynamics. Such data are presented in Table 1.2. in decreasing order of the difference between the proportion in the base year and that of the last year. We may note that in 16 countries the proportion increases and in 17 countries it decreases.

The relationship between the evolution of the number of pupils and students and the dynamics of the total population in the countries under analysis

Table 1.2.

The proportion of pupils and students in the total population and their evolution in the countries of the Europe Region

(%)

Country	Period	+/−
Malta	1980=17.3; 1984=19.2	+1.9
Hungary	1980=19.6; 1985=21.1	+1.5
Israel	1980=30.6; 1984=31.8	+1.2
Turkey	1981=18.6; 1983=19.8	+1.2
Romania	1980=23.6; 1985=24.6	+1.0
Bulgaria	1980=20.7; 1985=21.5	+0.8
Luxemburg	1980=15.7; 1983=16.4	+0.7
Ireland	1980=26.8; 1984=27.4	+0.6
Portugal	1980=18.5; 1983=19.1	+0.6
Canada	1980=24.1; 1985=24.5	+0.4
Greece	1980=19.8; 1983=20.2	+0.4
Czechoslovakia	1980=20.8; 1985=21.1	+0.3
Cyprus	1980=17.4; 1985=17.6	+0.2
Norway	1980=22.2; 1984=22.3	+0.1
Spain	1980=25.2; 1983=25.3	+0.1
USSR	1980=21.6; 1985=21.7	+0.7
Sweden	1980=20.5; 1984=20.4	−0.1
France	1980=24.3; 1984=24.1	−0.2
Iceland	1980=26.0; 1984=25.7	−0.3
Denmark	1980=21.5; 1984=21.0	−0.5
Finland	1980=21.3; 1985=20.8	−0.5
Poland	1980=21.9; 1985=21.4	−0.5
Belgium	1980=22.9; 1985=22.2	−0.7
Austria	1980=19.1; 1985=18.1	−1.0
German Dem. Rep.	1980=22.6; 1985=21.6	−1.0
United States	1980=26.0; 1985=24.8	−1.2
Italy	1980=22.5; 1984=21.2	−1.3
Switzerland	1980=17.5; 1985=16.1	−1.4
United Kingdom	1980=20.3; 1984=18.9	−1.4
Netherlands	1980=24.7; 1984=23.1	−1.6
Germany, Fed. Rep. of	1980=19.7; 1985=17.9	−1.8
Albania	1980=30.8; 1985=28.8	−2.0
Yugoslavia	1980=20.4; 1984=17.6	−2.8

Source: *Unesco Statistical Yearbook*, 1983, 1986, 1987.

— which may vary — is revealed by an analysis of the average annual rates recorded for the two indicators.

Thus, one can distinguish a group of *countries where there are increasing rates both in the population and in the number of pupils and students.* In the following percentages (%), the former refers to the total population and the latter to the number of pupils and students: Turkey (2.1 and 5.5); Albania (2.1 and 0.7); Israel (1.7 and 2.7); Cyprus (1.2 and 1.4); Canada (1.1 and 1.4); Iceland (1.1 and 0.3); Ireland (1.0 and 1.5); Poland (0.9 and 1.0); the USSR (1.0 and 1.1); France (0.5 and 0.3); Greece (0.7 and 1.3); Luxemburg (0.2 and 1.7); Portugal (0.4 and 1.4); Romania (0.5 and 1.3); Spain (0.7 and 0.8); Bulgaria (0.2 and 1.1); Czechoslovakia (0.2 and 0.5); Norway (0.3 and 0.4). The smallest range between the evolution of the two indicators is found in the USSR, Norway, Spain, Cyprus, Canada and Poland (where the ratio of the two indicators is closest to 1), and the widest divergence is seen in Turkey, Albania and Iceland.

To facilitate further analysis of the evolution of the two indicators in the groups of countries mentioned above, it would be useful to distinguish: a) *the countries where the growth rate of the population is higher than that of the number of pupils and students* — in the following percentages, the former represents the total population and the latter the number of pupils and students: Albania (2.1 and 0.7); Iceland (1.1 and 0.3); France (0.5 and 0.3); and b) *the countries where the growth rate of the number of pupils and students is higher than that of the total population* — in the following examples, the former percentage refers to the number of pupils and students and the latter to the total population: Turkey (5.5 and 2.1); Malta (3.8 and 1.1); Israel (2.7 and 1.7); Ireland (1.5 and 1.0); Canada (1.4 and 1.1); Portugal (1.4 and 0.4); Romania (1.3 and 0.5); the USSR (1.1 and 1.0); Spain (0.8 and 0.7); Bulgaria (1.1 and 0.2;) Greece (1.3 and 0.7); Norway (0.4 and 0.3); Czeschoslovakia (0.5 and 0.2); Luxemburg (1.7 and 0.2); Cyprus (1.4 and 1.2); Poland (1.0 and 0.9).

Both indicators are lower in the FRG,—0.2% in the total population and —2,5% in the numbers of pupils and students; similar decreases are seen in the GDR, —0.1 and —1.0 respectively.

A lower figure for the total population accompanied by a higher one for the number of pupils and students is recorded in Hungary: —0.1% for the total population and +1.3% for the number of pupils and students.

It is also to be noted that there is a group of *countries is which higher average annual rates are recorded in the total population and lower ones in the number of pupils and students.* In the following examples, the former percentage refers to the total population and the latter to the number of pupils and students: Yugoslavia (+0.7 and—4.3); the Netherlands (+0.5 and —1.2); Belgium (+0.1 and —0.6); Italy (+0.3 and —1.3); the United Kingdom (+0.1 and —1.7).

Moreover, in a few countries *a stagnant number for the total population and a lower one for pupils and students* has been recorded. The former percentage refers to the total population and the latter to the numbers of pupils and students: Austria (0.0 and —1.1); Denmark (0.0 and —0.7).

In Finland, while the number of pupils and students is stagnant (0.0%), the number of the total population is growing (by 0.6%); in the United States of America (0.0 and 1.0) respectively.

At world level, continental levels and other large geographical levels, the following observations can be made: a) an increase both in the number of students and in the number of pupils and students: at world level 116% and 107% respectively; similarly, in Africa 121% and 118%; North America 107% and 105%; South America 130% and 116%; Asia 130% and 106%; Oceania 125% and 102%; the Europe Region 106% and 102%; b) uncommon evolutions: in Europe, 112% in the number of students and 98% in the number of pupils and students; in the USSR, 98% in the number of students and 106% in the number of pupils and students.

1.3 Total number of students in higher education

An analysis of this indicator at world level illustrates that, in 1980, the total number of students throughout the world was 46.9 million, distributed as follows: Africa 1.4 million (3.0%), North America 14.5 million (30.9%), South America 3.3 million (7.0%), Asia 13.6 million (29.0%), Europe 8.5 million (18.1%), Oceania 0.4 million (0.9%) and the USSR 5.2 million (11.1%). In 1985, the total number of students was of 54.3 million, distributed as follows: Africa 1.7 million (3.1%), North America 15.5 million (28.6%), South America 4.3 million (7.9%), Asia 17.7 million (32.6%), Europe 9.5 million (17.5%), Oceania 0.5 million (0.9%) and the USSR 5.1 million (9.4%).

The Europe Region was represented by 27 million students in 1980 (57.6% of the world total), while in 1985 the number of students increased to 28.7 million (52.94% of the total).

The dynamics recorded at world level, between 1980–1985, was one of 116%, with the following distribution: Africa 121%, North America 107%, South America 130%, Asia 130%, Europe 112%, Oceania 125% and the USSR 98%. The Europe Region recorded an increase of 106% as illustrated in Table 1.3. which follows the evolution of the total number of students over the 1980–1985 period in the countries of the Europe Region.

On the basis of the data above the average annual rate of change in the number of students has been calculated and is given in Table 1.4.

The *average annual rate* results in the emergence of the following groups of countries:

— a group of countries whose *average annual growth rate is higher than 5%*: Turkey 14.1; Cyprus 10.1; Malta 9.2; Albania 8.6; Canada 7.8; Greece 7.0; Ireland 5.3; Switzerland 5.3; Portugal 5.2.; Spain 5.1 (in %);

— a group of countries recording *higher average annual growth rates between 3 and 5%*: the United Kingdom 5.0; Austria 4.8; Belgium 4.8; the FRG 4.7; Norway 4.2; France 3.7 (in %);

— a group of countries whose *average annual growth rate is below 3%*; Luxemburg 3.0; Bulgaria 2.4; Sweden 2.1; the Netherlands 2.0; Denmark 1.9; the GDR 1.6; Italy 1.4; Israel 1.1; Finland 0.8; the United States of America 0.2 (in %);

— a group of countries whose *average annual growth rate is negative:* the USSR —0.3; Hungary —0.2; Iceland —1.1; Czechoslovakia —3.1; Yugoslavia —3.4; Romania —3.8; Poland —5.3 (in %).

It is also important to consider the *evolution of the number of students in higher education compared with that of the total number of pupils and students:*

— in 14 countries of the Region, there are higher rates in both the number of students in higher education and in the total number of pupils and students (where the former are significantly higher than the latter): Turkey (14.1% in the former and 5.5% in the latter); likewise, Cyprus (10.1 and 1.4); Malta (9.2. and 3.8); Albania (8.6 and 0.7); Canada (7.8 and 1.4); Greece (7.0 and 1.3); Ireland (5.3 and 1.5); Portugal (5.2 and 2.4); Spain (5.1 and 0.8); Norway (4.2 and 0.4); France (3.7 and 0.3); Bulgaria (2.4 and 1.1); Finland (0.8 and 0.0); the United States of America (0.2 and 0.0) (0.0 = a slight increase, below 0.1%). In Israel alone, the former is 1.1% and the latter 2.7%;

Table 1.3.

The total number of students in higher education

Country	1980	1981	1982	1983	1984	1985
Albania	14568	...	17500	19670	21285	21995
Austria	136774	140720	146351	154126	165313	173215
Belgium	196153	*204823	219591	226890	245762	247499
Bulgaria	101359	97785	95723	98612	104303	113795
Canada	888444	924445	988334	1192925	1216651	1294194
Cyprus	1940	1977	1804	2201	2580	3134
Czechoslovakia	197041	198784	192397	181524	174843	169344
Denmark	106241	106669	110731	113157	114559	*114528
Finland	123165	...	127657	120157	121182	127976
France	1076717	...	1179268	*1223193	1255538	*1290148
German Dem. Rep.	400799	404618	403388	434326	431774	432672
Germany, Fed. Rep. of	1233221	...	1405478	1486024	1519050	1550211
Greece	121116	124694	137453	148515	...	...
Hungary	101166	102564	100564	99865	99986	99344
Iceland	5219	4383	5053	5212	5125	4949
Ireland	54746	59824	64116	64561	67378	*68119
Israel	97097	107583	110309	112901	101641	...
Italy	1117742	...	1090775	1120342	1181953	*1183245
Luxemburg	748	699	941	982	843	*842
Malta	947	...	1010	1337	1411	1474
Netherlands	360033	371515	379047	384407	390244	*392080
Norway	79117	...	88510	91330	94089	*97115
Poland	589134	544895	495902	475816	456661	454190
Portugal	92152	94958	99165	101308	112851	*113557
Romania	192769	190903	181081	174042	166328	159798
Spain	681022	704310	731053	787864	830664	**854484
Sweden	203699	205431	216412	223295	220947	*221328
Switzerland	85127	88385	...	95661	105897	110111
Turkey	246183	254446	281929	335080	417225	**449414
United Kingdom	827146	858416	980538	1000168	1006969	*1007444
United States	12096895	12371672	12425780	12464661	12241940	12247055
USSR	5235200	5284500	5315200	5301300	5280100	5147200
Yugoslavia	411995	403029	387337	375393	360397	**349013

Source: *Unesco Statistical Yearbook* 1983, 1986, 1987.

Note: * data estimated according to population and student numbers per 100,000 inhabitants, making use of information provided by ***World Education at a Glance***, Statistical Office of Unesco.

** CEPES sources.

— in 11 countries, there are higher average annual rates for the number of students in higher education but lower average annual rates in the total number of pupils and students: Switzerland 5.3 and –1.7% respectively; similarly: Sweden 1.7 and –0.0 (0.0 = a slight decrease, below 0.1%); the United Kingdom 4.0 and –1.7; Austria 4.8 and –1.1; Belgium 4.8 and 0.6; the FRG 4.7 and –2.5; Luxemburg 2.4 and 31.7; the Netherlands 1.7 and –1.2; Denmark 1.5 and –0.7; the GDR 1.6 and –1.0; Italy 1.2 and –1.3:

Table 1.4.

Average annual rate of change of the number of students

Countries	Period	Index (1980 = 100)	Average annual percentage change
Albania	1980–1985	151.0	8.6
Austria	1980–1985	126.6	4.8
Belgium	1980–1985	126.2	4.8
Bulgaria	1980–1985	112.3	2.3
Canada	1980–1985	145.7	7.8
Cyprus	1980–1985	161.5	10.1
Czechoslovakia	1980–1985	85.9	–3.0
Denmark	1980–1985	107.8	1.5
Finland	1980–1985	103.9	0.8
France	1980–1985	119.8	3.7
German Dem. Rep.	1980–1985	108.0	1.6
Germany, Fed. Rep. of	1980–1985	125.7	4.7
Greece	1980–1983	122.6	7.2
Hungary	1980–1985	98.2	–0.3
Iceland	1980–1985	94.8	–1.1
Ireland	1980–1985	124.4	4.5
Israel	1980–1984	104.7	1.2
Italy	1980–1985	105.9	1.2
Luxemburg	1980–1985	112.6	2.4
Malta	1980–1985	155.6	9.2
Netherlands	1980–1985	108.9	1.7
Norway	1980–1985	122.7	4.2
Poland	1980–1985	77.1	–5.3
Portugal	1980–1985	123.2	4.2
Romania	1980–1985	82.9	–3.8
Spain	1980–1985	125.5	4.6
Sweden	1980–1985	108.7	1.7
Switzerland	1980–1985	129.3	5.2
Turkey	1980–1985	182.6	12.8
United Kingdom	1980–1985	121.8	4.0
United States	1980–1985	101.2	0.2
USSR	1980–1985	98.3	–0.3
Yugoslavia	1980–1985	84.7	–3.3

– in 6 countries, there are lower numbers of students in higher education but higher total numbers of pupils and students (in %): Hungary –0.3 and 1.3; the USSR –0.3 and 1.1; Iceland –1.1 and 0.3; Czechoslovakia –3.1 and 0.5; Romania –3.8 and 1.3; Poland –5.3 and 1.0. In a single case, Yugoslavia, both indicators record lower average annual rates: –3.3 and –4.3, respectively;

In order to ascertain the place occupied by higher education in the educational system as a whole, the proportion of students in higher education in the total number of pupils and students acquires significance. At world and continental levels, and for other large geographical areas these proportions (in %) are as follows: in 1980 – 5.22 at world level, 1.79 in Africa, 14.5 in North America, 5.73 in South America, 2.73 in Asia, 8.07 in Europe, 8.29 in Oceania, 9.11 in the USSR and 11.40 in the Europe Region; in 1985 – 5.66 at world level, 1.85 in Africa, 14.89 in North America, 6.41 in South America, 3.36 in

Asia, 9.15 in Europe, 9.42 in Oceania, 8.50 in the USSR, and 11.89 in the Europe Region.

The evolution of these proportions for the countries of the Europe Region (arranged in decreasing order) is given in Table 1.5 below:

Table 1.5.

The evolution of the proportion of students in higher education in the total number of pupils and students

(%)

Country	Base year	Last year	+/−
Canada	1980=15.33;	1985=20.80	5.47
Germany, Fed. Rep. of	1980=10.19;	1984=13.84	3.65
Austria	1980= 9.48;	1985=12.65	3.17
Switzerland	1980= 7.63;	1985=10.76	3.13
Belgium	1980= 8.69;	1985=11.28	2.59
United Kingdom	1980= 7.25;	1984= 9.44	2.19
Norway	1980= 8.70;	1984=10.18	1.48
Netherlands	1980=10.30;	1984=11.72	1.42
German Dem. Rep.	1980=10.62;	1985=12.02	1.40
France	1980= 8.23:	1984= 9.49	1.26
Denmark	1980= 9.63:	1984=10.68	1.05
Sweden	1980=11.96;	1984=13.01	1.05
Italy	1980= 8.79:	1984= 9.79	1.00
Ireland	1980= 6.00;	1984= 6.96	0.96
Spain	1980= 7.21:	1983= 8.14	0.93
Cyprus	1980= 1.79;	1985= 2.67	0.88
Albania	1980= 1.77;	1985= 2.58	0.81
Greece	1980= 6.87;	1983= 7.46	0.59
Turkey	1981= 3.02;	1983= 3.57	0.55
Finland	1980=12.08;	1985=12.55	0.47
Malta	1980= 1.50:	1984= 1.95	0.45
Bulgaria	1980= 5.54;	1985= 5.90	0.36
Luxemburg	1980= 1.31;	1983= 1.64	0.33
Yugoslavia	1980= 9.03;	1983= 9.35	0.32
Portugal	1980= 5.03;	1983= 5.30	0.27
United States	1980=20.41;	1985=20.62	0.21
Hungary	1980= 4.82;	1985= 4.43	−0.39
Israel	1980= 8.17;	1984= 7.68	−0.49
USSR	1980= 9.11;	1985= 8.50	−0.61
Iceland	1980= 8.61;	1985= 7.99	−0.62
Romania	1980= 3.68;	1985= 2.86	−0.82
Czechoslovakia	1980= 6.19:	1985= 5.18	−1.01
Poland	1980= 7.57;	1985= 5.55	−2.02

Source: Computed from the *Unesco Statistical Yearbook* 1983, 1986, 1987; ***Higher Education and Economic Development in Europe, 1975–1980***. Vol. 1. CEPES, Bucharest, 1983.

A closer look at the data presented in Table 1.5. not only reveals the existence of *different patterns of evolution* in the proportion of students in higher education in the total number of pupils and students, but also *significant diffe-*

rences between countries in the levels of these proportions. If one employs the most recent information available (Table 1.5.), the following groups of countries emerge:

— a group of countries whose proportion of students in higher education is over 10%: Canada 20.80; the United States of America 20.62; the FRG 13.84; Sweden 13.01; Austria 12.65; Finland 12.55; the GDR 12.02; the Netherlands 11.72; Belgium 11.28; Switzerland 10.76; Denmark 10.68; Norway 10.18;

— a group of countries whose proportion is between 5 and 10%: Italy 9.79; France 9.49; the United Kingdom 9.44; Yugoslavia 9.35; the USSR 8.50; Spain 8.14; Iceland 7.99; Israel 7.68; Greece 7.46; Ireland, 6.96; Bulgaria 9.50; Poland 5.55; Portugal 5.30; Czechoslovakia 5.18;

— a group of countries with a proportion of higher education students lower than 5%: Hungary 4.43; Turkey 3.57; Romania 2.86; Cyprus 2.67; Albania 2.58; Malta 1.95; Luxemburg 1.64.

1.4 Number of students per 100,000 inhabitants

The number of students per 100,000 inhabitants constitutes a very significant indicator in ascertaining the degree of development within a country, especially in that of its higher education. It is of diverse significance in the evaluation of the role accorded to the training of highly qualified staff, who are intended to make decisive, long-term contributions to socio-economic development in the light of the accelerating progress of science and technology. Of course, this indicator should be interpreted with reference to the number of highly qualified staff already active in various fields of activity, as well as to its dynamics (continuous "stock" input and output). Table 1.6. presents the levels of this indicator for the base year (1980) and for the last year (1985 except for 12 countries for which 1984 has been used and, in one case, 1983).

In 1980, the number of students per 100,000 inhabitants was as follows: 1) the United States of America 5,313; 2) Canada 3,688; 3) Finland 2,577; 4) the Netherlands 2,544; 5) Israel 2,504; 6) Sweden 2,451; 7) the GDR 2,395; 8) Belgium 2,111; 9) Denmark 2,074; 10) France 2,005; 11) the FRG 1,987; 12) the USSR 1,972; 13) Italy 1,959; 14) Norway 1,936; 15) Iceland 1,921; 16) Yugoslavia 1,848; 17) Austria 1,822; 18) Spain 1,819; 19) Poland 1,656; 20) Ireland 1,610; 21) the United Kingdom 1,478; 22) Switzerland 1,346; 23) Czechoslovakia 1,287; 24) Greece 1,256; 25) Bulgaria 1,144; 26) Hungary 944; 27) Portugal 932; 28) Romania 868; 29) Turkey 554; 30) Albania 533; 31) Cyprus 308; 32) Malta 257; 33) Luxemburg 205.

In the last year of available data, 1985 in most cases, the following situation was recorded (the average annual increase or decrease as compared to the base year is also given in parentheses, as we are considering the same time period for all countries): 1) the United States of America 5,145 (—34); 2) Canada 5,099 (+282); 3) Israel 2,769 (+66); 4) the Netherlands 2,704 (+40); 5) Sweden 2,650 (+50); 6) Finland 2,616 (+8); 7) the GDR 2,581 (+37); 8) the FRG, 2,546 (+112); 9) Belgium 2,499 (+78); 10) France 2,362 (+71); 11) Norway 2,339 (+81); 12) Austria 2,309 (+97); 13) Denmark 2,236 (+41); 14) Spain 2,167 (+87); 15) Italy 2,065 (+27); 16) Iceland 2,040 (+24); 17 Ireland 1,888 (+69); 18) the USSR 1,847 (—25); 19) the United Kingdom 1,795 (+79);

Table 1.6.

The evolution of the number of students per 100,000 inhabitants

Country	1980	1981	1982	1983	1984	1985
Albania	533	. . .	*629	673	713	721
Austria	1822	1884	*1932	2056	2205	2309
Belgium	2111	2079	*2228	2298	2486	2499
Bulgaria	1144	1082	*1073	1100	1158	1255
Canada	3688	3733	*4012	*4793	*4838	5099
Cyprus	308	318	*281	338	391	469
Czechoslovakia	1287	1291	*1251	1177	1129	1087
Denmark	2074	*2083	*2164	2209	2236	. . .
Finland	2577	. . .	*2645	2486	2493	2616
France	2005	. . .	*2165	2235	2310	2362
German Dem. Rep.	2395	2405	*2416	2599	2582	2581
Germany, Fed. Rep. of	1987	. . .	*2280	2432	2492	2546
Greece	1256	*1282	1404	1518	. . .	. . .
Hungary	944	952	*939	935	936	929
Iceland	1921	1878	*2159	2199	2136	2040
Ireland	1610	*1739	*1841	1829	1888	. . .
Israel	2504	*2725	*2739	2755	2769	. . .
Italy	1959	. . .	*1926	1960	2065	. . .
Luxemburg	205	*192	257	270	232	. . .
Malta	257	. . .	*281	356	372	385
Netherlands	2544	2629	*2649	2677	2704	. . .
Norway	1936	. . .	*2151	2217	2278	2339
Poland	1656	1509	*1369	1305	1241	1221
Portugal	932	*964	*1002	1005	1112	. . .
Romania	868	852	*806	769	729	694
Spain	1819	*1870	*1927	2067	2167	. . .
Sweden	2451	2486	*2600	2682	2650	. . .
Switzerland	1346	1267	. . .	1667	1730	1790
Turkey	554	519	*609	707	863	. . .
United Kingdom	1478	*1523	*1741	1784	1795	. . .
United States	5313	5492	*5348	5322	5185	5145
USSR	1972	1975	*1968	1946	1918	1847
Yugoslavia	1848	*1794	*1711	1650	1571	. . .

Source: *Unesco Statistical Yearbook*, 1983, 1986, 1987.
Note: * — estimation.

20) Switzerland 1,790 (+89); 21) Yugoslavia 1,571 (−69); 22) Greece 1,518 (+87); 23) Bulgaria 1,255 (+22); 24) Poland 1,221 (−87); 25) Portugal 1,112 (+45); 26) Czechoslovakia 1,087 (−40); 27) Hungary 929 (−3); 28) Turkey 863 (+77); 29) Albania 721 (+38); 30) Romania 694 (−35); 31 Cyprus 469 (+32); 32) Malta 385 (+26); 33) Luxemburg 232 (+7).

The countries which registered *increases* (in the average annual rate) are as follows, in decreasing order: Canada 282; the FRG 112; Austria 97; Switzerland 89; Greece 87; Spain 87; Norway 81; the United Kingdom 79; Belgium 78; Turkey 77; France 71; Ireland 69; Israel 66; Sweden 50; Portugal 45; Denmark 41; the Netherlands 40; Albania 38; the GDR 37; Cyprus 32; Italy 27; Malta 26; Bulgaria 22; Finland 8; Luxemburg 7.

The following countries registered *decreases* (presented in the order of their average annual rate): Poland −87; Yugoslavia −69; Czechoslovakia −40; Romania −35; the United States of America −34; the USSR −25; Hungary −3.

When comparing the last year with the base year, we may observe that some countries remained in the same overall position in relation to the other countries in the table: the United States of America (1); Canada (2); the Netherlands (4); the GDR (7); France (10); Cyprus (31); Malta (32); and Luxemburg (33).

A significant number of countries improved their overall positions: Israel (from 5 to 3); Sweden (from 6 to 5); the FRG (from 11 to 8); Belgium (from 9 to 8); Austria (from 17 to 12); Norway (from 14 to 11); Spain (from 18 to 14); Ireland (from 20 to 17); the United Kingdom (from 21 to 19); Switzerland (from 22 to 20); Greece (from 24 to 22); Bulgaria (from 25 to 23); Portugal (from 27 to 25); Turkey (from 20 to 28); Albania (from 30 to 29).

Other countries occupied lower positions in the last year than they did in the base year: Finland (6 instead of 3); Belgium (9/8); Denmark (13/9); Italy (15/13); Iceland (16/15); the USSR (18/12); Yugoslavia (21/16); Poland (24/19); Czechoslovakia (26/23); Hungary (27/26); Romania (30/28).

International statistics relating to higher education make frequent reference to the indicator "Enrolment Ratios in the Third Level between 20 and 24 Years, by Sex", which will not be included in this study. In the "Experts' Consultation on the Application of the International Standard Classification of Education to Programmes of Education at the third Level in Countries of the Europe Region" (Bucharest, May 11—13, 1987), organised by the Unesco European Centre for Higher Education, the participants considered that, the above-mentioned indicator was of no further relevance to this specific area of study, as the students enrolled in any given country might not belong to this age group, especially given the development of part-time and continuing education.

1.5 Number of national students per 100,000 inhabitants

In order to evaluate the degree of development in higher education, we must take into consideration the significant proportion of foreign students in the total number of students in the countries of the Region. It would be useful, therefore, to isolate the indicator "Number of National Students per 100,000 Inhabitants" educated in any given country, since the new highly qualified national staff has a direct impact on the socio-economic development of each country.

In our attempt to present a picture of the evolution of this indicator (by deducting the number of foreign students from the total number of students and thus obtaining the number of national students educated in any given country, then computing the figure for 100,000 inhabitants) examination of the available data revealed the following: a) for some countries, no data on foreign students were available, which might imply that no such students are present or that their presence is insignificant (as in Albania and Iceland);

b) in other cases, data were available for the years on and around 1980 but subsequently data were lacking (as in Norway, Spain, Sweden); c) for other countries, no data were available for 1985, accordingly 1984 has been taken as the last year (as Denmark, Greece, Ireland, Israel, Italy, Portugal) or as in the case of Luxemburg, 1983.

Table 1.7. presents the evolution of the numbers of national students per 100,000 inhabitants bearing in mind the circumstances mentioned above. The countries are listed alphabetically.

Table 1.7.

The evolution of the number of national students

Country	The number of national students		Average annual percentage change		National students per 100,000 inhabitants	
	1980	1985	For total students	For national students	1980	1985
Austria	124,926	157,827	4.8	4.8	1665	2104
Belgium	183,278	222,738	4.8	4.0	1860	2249
Bulgaria	97,371	106,541	2.3	1.8	1099	1175
Canada	860,001	1,189,698	7.8	6.7	3570	4679
Cyprus	1,609	2,590	10.1	10.0	256	387
Czechoslovakia	193,399	165,169	−3.0	−3.2	1263	1060
Denmark	103,206	111,458*	1.5	2.0	2015	2176
Finland (1)	122,555	126,997	0.8	0.7	2564	2588
France	965,954	1,158,169	3.7	3.7	1798	2120
German Dem. Rep.,	393,693	423,441	1.6	1.5	2352	2526
Germany, Fed. Rep. of	1,171,380	1,470,857	4.7	4.6	1903	2416
Greece	113,443	156,656**	7.2	6.6	1176	1494
Hungary	98,424	96,859	−0.3	−0.3	919	901
Ireland	51,901	66,345	4.5	5.0	1528	1839
Israel	...	100,272*	1.2	...	...	2446
Italy	1,088,295	1,154,405*	1.2	1.2	1907	2014
Luxemburg	699	899	2.4	6.5	192	248
Malta	911	1,449	9.2	9.7	247	378
Netherlands (2)	355,905	386,375	1.7	1.7	2515	2668
Norway	77,977	...	4.2	...	1908	...
Poland	586,222	451,204	−5.3	−5.4	1648	1213
Portugal	90,834	110,450*	4.2	5.0	1117	1082
Romania	176,881	149,024	−3.8	−3.5	797	647
Spain	670,025	...	4.6	...	1790	...
Sweden	190,517	...	1.7	...	2292	...
Switzerland	70,411	92,715	5.2	5.7	1113	1455
Turkey	239,528	442,393	12.8	13.0	539	898
United Kingdom	771,143	943,922	4.0	4.1	1378	1682
United States	11,785,013	11,901,275	0.2	0.2	5176	5000
USSR	5,179,900	5,080,500	−0.3	−0.4	1951	1823
Yugoslavia	407,569	341,629	−3.3	−3.6	1828	1476

Notes : (1) University only.
(2) The data refer to full-time students only.
* 1984.
** 1983.

In 1980, the countries occupied the following ordinal positions: 1) the United States of America 5,176; 2) Canada 3,570; 3) Finland 2,564; 4) the Netherlands 2,515; 5) the GDR 2,352; 6) Sweden 2,292; 7) Denmark 2,015; 8) the USSR 1,951; 9) Norway 1,908; 10) Italy 1,907; 11) the FRG 1,903; 12) Belgium 1,860; 13) Yugoslavia 1,828; 14) France 1,798; 15) Spain 1,790; 16) Austria 1,665; 17) Poland 1,648); 18) Ireland 1,527; 19) the United Kingdom ,1378; 20) Czechoslovakia 1,263; 21) Greece 1,176; 22) Portugal 1,117; 23) Switzerland 1,113; 24) Bulgaria 1,099; 25) Hungary 919; 26) Romania 797; 27) Turkey 539; 28) Cyprus 256; 29) Malta 247; 30) Luxemburg 192. Albania, Iceland and Israel are missing from the list because of lack of available data.

In the last year for which data were available — 1985, in the majority of cases — the situation is as follows: 1) the United States of America 5,000 (—35 students on annual average); 2) Canada 4,679 (+122 students on annual average); similarly: 3) the Netherlands 2,668 (+31); 4) Finland 2,588 (+5); 5) the GDR 2,416 (+103); 6) the FRG 2,416 (+103); 7) Belgium 2,249 (+78); 8) Denmark 2,176 (+40); 9) France 2,120 (+64); 10) Austria 2,104 (+88); 11) Italy 2,014 (+27); 12) Ireland 1,839 (+62); 13) the USSR 1,823 (—26); 14) the United Kingdom 1,682 (+61); 15) Greece 1,494 (+106); 16) Yugoslavia 1,476 (—77); 17) Switzerland 1,455 (+68); 18 Poland 1,213 (—87); 19) Bulgaria 1,175 (+15); 20) Portugal 1,082 (—9); 21) Czechoslovakia 10,060 (—41); 22) Hungary 901 (—6); 23) Turkey 898 (+72); 24) Romania 647 (—30); 25) Cyprus 387 (+26); 26) Malta 378 (+26); 27) Luxemburg 248 (+19);. Albania, Iceland, Israel, Norway Spain, and Sweden are not listed due to the lack of more recent data on foreign students.

The countries *recording increases* (in their annual averages can be ordered as follows: 1) Canada 222; 2) the GDR 103; 3) the FRG 104; 4) Austria 88; 5) Belgium 78; 6) Turkey 72; 7) Switzerland 68; 8) France 64; 9) Ireland 62; 10) the United Kingdom 61; 11) Denmark 40; 12) the Netherlands 31 13) Italy 27; 14) Cyprus 26; 15) Malta 26; 16) Luxemburg 19; 17) Bulgaria 15; 18) Finland 5.

Decreases were recorded (in their annual averages) by: 1) Poland —87; 2) Yugoslavia —70; 3) the United States of America —35; 4) Czeschoslovakia —41; 5) Romania —30; 6) Hungary —4.

It is also important to note the *evolution of the total number of students related to that of the number of national students*, by comparing the annual average increases and decreases (in %). Accordingly, the following groups emerge:

— countries in which both indicators increase or decrease proportionately; Austria +4.8; France +3.7; Hungary —0.3; Italy +1.2; the Netherlands +1.7; the United States of America +0.2, illustrating the stability of the proportion of foreign students in the total number of students;

— countries in which both indicators are on the increase, the first of which more markedly so: Belgium (4.8/4.0); Bulgaria (2.3/1.8); Canada 7.8/6.7); Cyprus (10.1/10.0); Finlanda (0.8/8.7); the GDR (1.6/1.5); the FRG (4.7/4.6); Greece (7.2/6.6). Thus, the number of foreign students is increasing at a faster rate than that of the number of national students;

— countries in which both indicators are on the increase, the second indicator more markedly so: Denmark (1.5/2.0); Ireland (4.5/5.0); Luxemburg

(2.4/6.5); Malta (9.2/9.7); Portugal (4.2/5.0); Switzerland 5.2/5.7); Turkey (12.8/13.0); the United Kingdom (4.0/4.1). In this group, the number of national students is growing at a faster rate and the proportion of foreign students is falling;

— countries in which both indicators are on the decrease, the former at a faster rate: Romania (—3.8/—3.5). This case represents a more significant fall in the number of foreign students and an increase in the proportion of national students;

— countries in which the two indicators are on the decrease, the latter more markedly so: Czechoslovakia (—3.0/—3.2); Poland (—5.3/—5.4); the USSR (—0.3/—0.4); Yugoslavia (—3.3/—3.6). This represents a greater decrease in the number of national students, thus resulting in an increasein the proportion of foreign students in the total number of students.

2. EVOLUTION IN THE STRUCTURE OF STUDENT ENROLMENT

2.1 Distribution of student enrolment by International Standard Classification of Education (ISCED) levels

Students attending institutions of higher education generally follow course programmes which correspond to levels 5, 6, and 7 identified in the International Standard Classification of Education (ISCED).

Level 5 is the first stage of higher education, leading to a diploma which is not equivalent to a first university degree. At this level, the majority of course programmes are intended for the student who has completed secondary education and has decided to pursue higher training in establishments where less importance is attached to general and theoretical scientific knowledge and more stress is placed on the practical and vocational application of knowledge. Therefore, course programmes at this level are generally practical in character and the degree of specialisation prepares the student for professional responsibilities and good future prospects. The duration of study is generally shorter than that of a university degree, usually lasting less than 4 years, and the level of specialisation and knowledge are essential for access to the corresponding profession. National educational authorities often hold differing points of view regarding course programmes shorter than two years in length. Some specialists consider that such post-secondary education programmes, although shorter in duration, should not be excluded from the statistics of education and should be included in level-5 classification. Others consider, however, that such shorter programmes should not be included in higher education and should constitute a separate category (in particular the preparatory courses for entrance to university).

Level 6 includes higher education course programmes leading to a first university degree or an equivalent diploma. At this level, the majority of course programmes are intended for the students who have completed secondary education and decided to receive higher education. In general, the emphasis is academic and is placed on the historical or theoretical aspects of the subjects taught, while less stress is placed on the practical application of the subject. This level of education is aimed at training the student so as to make him competent at carrying out individual research work on completion of his studies. The duration of study is usually at least 4 years in full-time education, and sometimes 5, 6 or even 7 years. A clear definition of the "first academic degree" is very important, as it refers not only to the obvious degrees in the arts and sciences, but also to such professional titles as "Bachelor of Law" or "Bachelor of Medicine" (in some countries), or to other degrees, such as that of "Doctor in Medicine" (in some other countries). This category should also include the various programmes leading to the simultaneous acquisition of two diplomas at the same level (6). Furthermore, it is important to understand that the structure of the university does not dictate the classification of a course programme as level 6, but rather the character and content of the course itself, in accordance with the above. It should also be specified that a person who has completed a level-6 diploma and pursues another course programme at the same level does not necessarily qualify for inclusion in level 7. Similarly, those who receive level-6 diplomas and attend occupational courses to update and refresh their knowledge, that is, at the same level, cannot be included in level 7. Bearing the above in mind, it is obvious that this level of higher education (level 6) is, on the whole, the best interpreted and most correctly used in the computation of educational statistics. However, there are cases of overlapping with levels 5 and 7, most often due to the fact that the relevant national statistics do not always faithfully reflect the structures at the ISCED levels or do not take this question into consideration.

Level 7 of higher education is the second stage, leading to a higher academic degree or an equivalent diploma. It includes, on the one hand, course programmes undertaken by students who already hold a first university degree or equivalent, involving specialisation in a narrower field of study. The numerous professional upgrading courses of a very high level also fall into this category. On the other hand, level 7 also includes course programmes undertaken by persons who have completed university education at level 7 and are carrying out original scientific research on the completion of certain programmes, as well as those studying toward a doctoral degree or other scientific degrees (postgraduate education). The degrees or diplomas conferred on the completion of such programmes are obtained following a series of examinations and the presentation of a thesis.

To analyse the student distribution over the ISCED levels, it is first necessary to give an overview of the most recent situation, as presented in Table 2.1. Note that for 14 countries the last year of available data was 1985, for 11 countries 1983, for 2 countries 1982, and for the other 3 countries data were only available for previous years. Considering the difficulties encountered, as mentioned above, in categorising the various course programmes into the three levels — even observing the ISCED-established criteria —, they provide only a *referential framework* for the policies of various countries in structuring their higher educational systems into levels, often reflected by the emphasis on certain criteria considered at each level: duration of study, the mainly theoretical or practical content, relevance to future occupational demands, completion of a previous stage of education (certified by a corresponding diploma), etc.

Bearing the above in mind, Table 2.1. reveals the following more important observations (with specific reference to the most recent data):

— in 2 countries, Cyprus and Luxemburg, all students are in level 5;

— in 3 countries, Albania, Czechoslovakia and Romania, all students are in level 6;

Table 2.1.

Distribution of student enrolment by ISCED levels

(%)

Country	Base year				Last year			
	Year	Level Categories			Year	Level Categories		
		5	6	7		5	6	7
Albania	1980	—	100.00	—	1984	—	100.00	—
Austria	1989	7.35	91.03	1.62	1985	7.16	89.65	3.19
Belgium	...	...	...	...	1985	45.16	54.84	./.
Bulgaria	1980	13.85	84.27	1.98	1985	8.38	89.20	2.42
Canada	1980	29.81	61.56	8.63	1985	19.38	72.97	7.65
Cyprus	1980	100.00	—	—	1985	100.00	—	—
Czechoslovakia	1980	—	100.00	—	1985	—	100.00	—
Denmark	1980	22.04	77.96	./.	1984	25.32	74.68	./.
Finland	1980	32.67	62.90	4.43	1985	28.39	66.02	5.59
France	1980	9.70	73.09	17.21	1982	16.14	71.50	12.36
German Dem. Rep.	1980	22.63	43.05	34.32	1985	27.11	38.54	34.35
Germany, Fed. Rep. of	1980	15.67	82.95	1.38	1985	13.79	84.74	1.47
Greece	1980	29.23	70.77	./.	1983	32.50	67.50	./.
Hungary	1980	40.95	13.81	45.24	1985	41.58	15.74	42.68
Ireland	1980	37.34	53.48	3.18	1982	41.86	50.08	8.06
Israel	...	...	...	...	1984	39.83	43.55	16.62
Italy	1980	2.81	91.58	5.61	1984	2.64	91.63	5.73
Luxemburg	1980	100.00	—	—	1984	100.00	—	—
Malta	1980	4.44	95.56	—	1985	—	99.53	0.47
Netherlands	...	...	...	...	1984	56.40	43.60	./.
Norway	1981	46.43	23.57	30.00	1984	46.04	26.29	27.67
Poland	1980	23.00	12.76	64.24	1985	20.90	72.83	6.27
Portugal	1980	8.45	90.95	0.60	1985	9.33	89.71	0.96
Romania	1980	—	100.00	—	1985	—	100.00	—
Spain	1980	26.75	73.25	./.	1984	23.95	76.05	./.
Sweden	1979	64.90	29.00	6.10	...	...	...	...
Switzerland	1980	28.98	61.37	9.65	1985	33.49	56.40	10.11
Turkey	1980	7.34	92.66	—	1984	10.94	84.50	4.56
United Kingdom	1980	28.80	59.09	12.11	1983	36.40	53.07	10.53
United States	...	...	...	...	1981	38.10	48.80	13.10
Yugoslavia	1980	24.68	75.32	./.	1984	19.72	80.28	./.

Sources: *Unesco Statistical Yearbook* 1985, 1986, 1987;
Application of ISCED to Programmes of Education at the of Third Level in Countries of the Europe Region, Unesco Office of Statistics, 1986.

Note: The sign ./. shows the inclusion of the data in level 6.

— in 2 countries, Iceland and the USSR, no data are available to facilitate separation of enrolments into levels;

— in 6 countries, Belgium, Denmark, Greece, the Netherlands, Spain and Yugoslavia, level 5 is separately specified but level 7 is included in level 6.

When students are divided into levels, one sees that in most countries the main share is held by level 6 (excluding those cases in which all students have been included in level 6 and when level 7 students are also included in level 6): Malta 99.53%, Italy 91.63, Portugal 89.71, Austria 89.65, Bulgaria

89.20, the FRG 84.74, Turkey 84.50, Canada 72.97, Poland 72.83, France 71.50, Finland 66.02, Switzerland 56.40, the United Kingdom 53.07, Ireland 50.08.

Only a small percentage of students fall into level 6 in Hungary 15.74%, Norway 26.29 and Sweden 29.00.

In 2 countries, the greatest percentage is to be found in level 5: Sweden 64.90% and the Netherlands 56.40.

A significant percentage of students fall into level 5 in another 11 countries: Norway 46.04%, Belgium 45.16, Ireland 41.86, Hungary 41.58, Israel 39.83, the United States of America 38.10, the United Kingdom 36.40, Greece 32.50, Finland 28.39, the FRG 27.11 and Denmark 25.32.

Only very small percentages are seen in level 5 in: Portugal 9.33%, Bulgaria 8.38, Austria 7.16, and Italy 2.64.

The percentage distribution in level 7 is quite considerable in some countries: Hungary 42.68%, the GDR 34.35, Norway 27.67, Israel 16.62, the United States of America 13.10, and France 12.36.

In most cases where student numbers are specified for level 7 the percentages are slightly lower in comparison with those of the other two levels: Malta 0.47%, Portugal 0.96, the FRG 1.4, Bulgaria 2.42, Austria 3.19, Turkey 4.56, Finland 5.59, Italy 5.73, Sweden 6.10, Poland 6.27, Canada 7.65, Ireland 8.06, Switzerland 10.11, and the United Kingdom 10.53.

The dynamics of these structures, using the available data in 1980 as the base year (except for Norway, for which 1981 is used), reveal the following:

— an increase in the percentage distribution of level 5 in the last year as compared to 1980 in: Denmark (from 22.04% to 25.32%), France (from 9.70% to 16.14%), the GDR (from 22.63% to 27.11%), Greece (from 29.23% to 32.50%), Ireland (from 37.34% to 41.86%), Switzerland (from 28.98% to 33.49%), Turkey (from 7.34% to 10.94%), the United Kingdom (from 28.80% to 36.40%);

— a decrease in the percentage distribution of level 5 during the time interval under consideration in: Bulgaria (from 13.85% to 8.38%); Canada (from 29.81% to 19.38%); Finland (from 32.67% to 28.39%); Poland (from 23.00% to 20.90%); Spain (from 26.75% to 23.95%); Yugoslavia (from 24.68% to 19.72%);

— hardly any change registered between the two years at level 5 in: Austria (7.35% and 7.16%); the FRG (15.67% and 13.79%); Hungary (40.95% and 41.58%); Italy (2.81% and 2.64%); Norway (46.43% and 46.04%); Portugal (8.45% and 9.33%);

— an increase in the percentage distribution of level 6 in: Bulgaria (from 84.27% to 89.20%); Canada (from 61.56% to 72.97%); Finland (from 62.90% to 66.02%); the FRG (from 82.95% to 84. 74%); Hungary (from 13.81% to 15.74%); Malta (from 95.56% to 99.53%); Norway (from 23.57% to 26.29%); Poland (from 12.76% to 72.83% — having reallocated teaching programmes between levels 6 and 7); Spain (from 73.25% to 76.05%);

— a decrease in the percentage distribution of level 6 in: Austria (from 91.03% to 89.65%); France (from 73.09% to 71.50%); the GDR (from 43.05% to 38.54%); Ireland (from 53.48% to 50.08%); Switzerland (from 61.37% to 56.40%); Turkey (from 92.66% to 84.55%); the United Kingdom (from 59.09% to 53.07%);

— hardly any change is registered between the two years at level 6 in: Italy (91.58% and 91.63%); Portugal (90.95% and 89.71%);

— an increase in the percentage distribution of level 7 in: Austria (from 1.62% to 3.19%); Bulgaria (from 1.98% to 2.42%); Finland (from 4.43% to 5.59%); Ireland (from 3.18% to 8.06%); Portugal (from 0.60% to 0.96%); Switzerland (from 9.65% to 10.11%);

— a decrease in the percentage in level 7 in: Canada (from 8.63% to 7.65%); France (from 17.21% to 12.36%); Hungary (from 45.24% to 42.68%); Norway (from 30.00% to 27.67%); Poland (from 64.24% to 6.24% — having reallocated the programmes between levels 6 and 7); the United Kingdom from 12.11% to 10.53%);

— hardly any change is registered between the two years at level 7 in: the GDR (34.32% and 34.35%); the FRG (1.38% and 1.47%); Italy (5.61% and 5.73%);

— for those countries where levels 6 and 7 are presented together, a decrease in the percentage distribution is evident in Denmark from 77.96% to 74.68% and Greece from 70.77% to 67.50%, and in Yugoslavia an increase is recorded from 75.32% to 80.28%.

2.2 Structure of student enrolment by fields of study

In accordance with ISCED classification, course programmes are grouped into 18 fields of study. Courses in the different fields are, as a rule, offered at all three corresponding levels of higher education (5, 6 and 7), except for three fields 9, 15 and 16) in which training is only offered at level 5. However, some countries (mentioned below) do not take the categorisation into consideration. Below are set out the fields of study, with the corresponding educational programmes (profiles) for each level (the order of presentation of the fields of study is the one utilised in the Unesco Statistical Yearbook, and the subsequent analyses observe the same order).

Thus, level 5 education comprises the following fields (with specification of the corresponding programmes in parentheses): 1. *Education science and teacher-training* (general teacher-training with specialisation in a non-vocational subject; for pre-school and kindergarten; for adult education; for handicapped children; others); 2. *Humanities, religion and theology* (programmes for interpreters and translators; language programmes, except the current or vernacular language; programmes in the current or vernacular language and literature; religion and theology; others); 3. *Fine and applied arts* (general programmes of art studies; music; drama; photography and cinematography; others); 4. *Law* (law and jurisprudence — programmes for local magistrates); 5. *Social and behavioural science* (economics; political science; sociology; psychology; others); 6. *Commercial and business administration* (general commercial; secretarial; business machine operation, except electronic data processing; electronic data processing; accountancy; business administration; marketing and sales; financial management and investment analysis; public administration; institutional administration; others); 7. *Mass communication and documentation* (journalism; radio and television broadcasting; public relations; library technician; technicians in museums and similar repositories; documentation techniques; others); 8. *Home economics* (domestic science; general programmes in home economics; food management and nutrition; child care; household arts; others); 9. *Service trades* (catering, restaurant and hotel;

retailing; tourist trades; others); 10. *Natural science* (biological science; chemistry; geological science; physics; others); 11. *Mathematics and computer science* (general mathematics; statistics; actuarial science; applied mathematics; computer science); 12. *Medical science and health related sciences* (public health inspection; physiotherapy and occupational therapy; nursing; midwifery; medical X-ray techniques; dental practitioner; pharmacy; optometry; others); 13. *Engineering* (surveying; drafting and design; chemical engineering and material technology; civil engineering; electrical and electronics engineering; industrial engineering; metallurgical engineering; mining engineering; mechanical engineering; agricultural, forestry and fishery engineering; others); 14. *Architecture and town planning* (general programmes in architecture and town planning; structural architecture; landscape architecture; town or community planning); 15. *Trade, craft and industrial programmes* (food processing; electrical and electronics trade; metal trades; mechanical and mechanical repair trades; heating; air-conditioning and refrigeration trades; textile techniques; graphic arts; laboratory technician; optical lens making; others); 16. *Transport and communications* (crew; ship's officers; railway operating trades; road motor vehicle operating; postal services, except electronics equipment installation and servicing; others); 17. *Agriculture, forestry and fishery* (general programmes in agriculture; animal husbandry; horticulture; crop husbandry; agricultural economics; soil and water technician; forestry and forest product techniques; fishery technician; others); 18. *Other and not specified* (police work and related law enforcement; fire-protection and fire-fighting; social work; vocational counselling; environmental studies; physical education; military programmes; others).

Level 6 education comprises the following fields (with the specification of the corresponding programmes in parantheses): 1. *Education science and teacher-training* (general teacher-training; with specialisation in non-vocational subjects; for teaching practical or vocational subjects; for pre-school or kindergarten; for adult education; for handicapped children; for teacher trainers; others); 2. *Humanities, religion and theology* (general programmes in the humanities; the current or vernacular language and its literature; other living languages and their literatures; "dead" languages and their literatures; linguistics; comparative literature; history; archaeology; philosophy; religion and theology; others); 3. *Fine and applied arts* (general programmes of art studies; drawing and painting; sculpture; music; drama; interior design; others); 4. *Law* (general programmes in law; programmes intended for notaries); 5. *Social and behavioural science* (general programmes in the social and behavioural sciences; economics; political science; sociology; anthropology; psychology; geography; studies of regional cultures; others); 6. *Commercial and business administration* (general programmes in business administration; accountancy; public administration; institutional administration; others); 7. *Mass communication and documentation* (journalism; radio and television broadcasting; public relations; library science; others); 8. *Home economics* (domestic science; general programmes in home economics; programmes in home economics with empahsis on household and consumer food research; nutrition; programmes in home economics with emphasis on household arts; others); 9. *Service trades* (no programmes at level 6); 10. *Natural science* (biological science; chemistry; geological science; physics; astronomy; meteorology; oceanography; others); 11. *Mathematics and computer science* (general programmes in mathematics; statistics; actuarial science; computer science; others); 12. *Medical science and health-related* (programmes in hygiene; medicine and surgery; rehabilitation medicine; nursing; medical technology; dentistry, stomatology and odontology; pharmacy; others); 13. *Engineering* (chemical engineering; civil engineering; electrical and electronics engineering; industrial engineering; metallurgical engineering; mining engineering; mechanical engineering: agricultural engineering: forestry engineering: others); 14. *Architecture and town-planning* (general programmes in architecture and town-planning; structural architecture; landscape architecture; town-planning); 15. *Trade, craft and industrial programmes* (no programmes at level 6); 16. *Transport and communications* (no programes at level 6); 17. *Agriculture, forestry and fishery* (general programmes in agriculture; animal husbandry; horticulture; crop husbandry; agricultural economics; food science and technology; soil and water sciences; veterinary medicine; forestry; fishery science and technology; others); 18. *Other and not specified* (criminology; other civil security and military programmes; social welfare; vocational counselling; environmental studies; physical education; nautical science; others).

Level 7 education comprises the following fields (with the corresponding programmes given in parentheses): 1. *Education science and teacher-training* (general programmes in education science; education with specialisation in curriculum development in vocational subjects; programmes with specialisation in early childhood education; programmes with specialisation in adult education; programmes with specialisation in the education of the handicapped; education for teacher trainers; education science without teacher training; others); 2. *Humanities, religion and theology* (current or vernacular language and its literature; other living languages and their literatures; "dead" languages and their literatures, linguistics; comparative literature; history; archaeology; philosophy; religion and theology; others); 3. *Fine and applied arts* (history and philosophy of art; drawing and painting; sculpturing; music; drama; interior design; others); 4. *Law* (jurisprudence and history of law; international law; labour law; maritime law; others); 5. *Social and behavioural science* (economics; political science; demography; sociology; anthropology; psychology; geography; studies of regional cultures; others); 6. *Commercial and business administration* (business administration with specialisation in marketing; business administration with specialisation in finance and investment; business administration with other specialisation; public administration; institutional administration); 7. *Mass communication and documentation* (journalism; radio and television broadcasting; public relations; library science; others); 8. *Home economics* (domestic science household and consumer food research; nutrition; household arts; others); 9. *Service trade* (no prorammes at level 7); 10. *Natural science* (biological science; chemistry; geological science; physics; astronomy; meteorology; oceanography; others). 11. *Mathematics and computer science* (statistics; actuarial science; computer science; others); 12. *Medical science and health-related* (medical specialities; dental and stomatological specialities; pharmacy; others); 13. *Engineering* (chemical engineering; civil engineering; electrical and electronic engineering; industrial engineering; metallurgical engineering; mining engineering; mechanical engineering; agricultural engineering; forestry engineering; others). 14. *Architecture and town-planning* (structural architecture; landscape architecture; town-planning); 15. *Trade, craft and industrial programmes* (no programmes at level 7); 16. *Transport and communications* (no programme at level 7); 17. *Agriculture, forestry and fishery* (animal husbandry; horticulture; crop husbandry; agricultural economics; food sciences and technology; soil and water sciences; veterinary medicine; forestry; fishery science and technology; others); 18. *Other and not specified* (criminology; other civil security and military programmes; social welfare; vocational counselling; environmental studies; others).

From the analysis of the *percentage distribution of each field of study in the total number of students in each country*, based on the most recent data available, one can observe certain common features of the structures of higher education in the various countries. The most recent available data relate to 1985 for 16 countries (Albania, Austria, Belgium, Bulgaria, Canada, Cyprus, Czechoslovakia, Finland, the GDR, the FRG, Hungary, Malta, Poland, Romania, Switzerland, and the USSR), to 1984 for 11 countries (Denmark, Israel, Italy, Luxemburg, the Netherlands, Norway, Portugal, Spain, Sweden, Turkey, and Yugoslavia), to 1983 for 3 countries (Greece, Iceland, and the United Kingdom), and to 1982 for 2 countries (France and Ireland). There are no such data available for the United States of America.

The situation for each field of study — considering only the data which do not cover several fields of study — is as follows (the percentage distribution of the field in the total number of students in each country is given in decreasing order):

— *Education science and teacher training* — Hungary 38.87; the USSR 29.52; Malta 21.58; Poland 19.51; Czechoslovakia 17.85; the Netherlands 18.43; Denmark 17.21; Iceland 16.12; Albania 15.37; Norway 14.78; Turkey 13.98; Bulgaria 13.60; Cyprus 13.24; Spain 12.95; the GDR 12.74; Belgium 12.30; Portugal 12.25; Luxemburg 12. 22; Sweden 11.78; Yugoslavia 9.56; Finland 9.42; Ireland 8.11; the United Kingdom 7.55; Greece 6.45; Austria 6.41; Canada 6.09; the FRG 6.06; France 4.07; Italy 3.29; Switzerland 0.05;

— *Humanities, religion and theology* — France 23.94; Iceland 18.69; Austria 15.24; Ireland 14.68; Switzerland 14.34; Portugal 14.30; Finland 14.10; Italy 13.68; Denmark 13.61; Greece 13.53; the FRG 12.91; Spain 12.55; Luxemburg 11.87; Sweden 11.06; Bulgaria 9.66; Norway 8.69; the United Kingdom 8.56; Poland 8.51; the Netherlands 7.98; Yugoslavia 7.65; Turkey 6.12; Belgium 5.96; Austria 5.24; Albania 5.12; Canada 4.39; Hungary 2.53; the GDR 2.03; Malta 0.48;

— *Fine and applied arts* — Austria 5.40; the Netherlands 5.13; the United Kindgom 4.35; Ireland 3.89; Denmark 3.47; Canada 3.24; the FRG 3.14; Switzerland 2.95; Sweden 2.65; Albania 2.47; Bulgaria 2.35; Finland 1.91; Belgium 1.83; Poland 1.79; Portugal 1.41; Czechoslovakia 1.36; Hungary 1.29; Spain 1.24; Norway 1.20; Turkey 1.14; Italy 1.11; Yugoslavia 1.10; the GDR 1.06; France 1.02; Greece 0.98; the USSR 0.94; Romania 0.56; Iceland 0.27;

— *Law* — Spain 15.02; Italy 14.69; France 12.14; Yugoslavia 10.80; Portugal 10.74; Greece 9.64; Austria 8.84; Switzerland 8.34; the Netherlands 7.27; Malta 6.92; Iceland 6.27; Hungary 5.87; the FRG 5.58; Belgium 5.55; Norway 5.31; Turkey 4.57; Sweden 4.06; Luxemburg 4.04; Denmark 3.89; Finland 3.14; Czechoslovakia 3.09; Poland 3.04; the United Kingdom 2.80; Israel 2.57; Bulgaria 1.94; Albania 1.84; Ireland 1.59; Romania 1.49; Canada 1.04; the GDR 1.00;

— *Social and behavioural science* — Turkey 21.85; the FRG 18.54; Italy 17.70; Switzerland 16.96; Yugoslavia 16.21; the Netherlands 15.99; Albania 13.67; Spain 11.34; Portugal 10.85; Denmark 9.36; Canada 9.19; Greece 9.07; Austria 8.94; Norway 8.29; Belgium 8.11; Finland 7.40; France 7.19; Sweden 6.80; the United Kingdom 6.48; the GDR 5.36; Iceland 4.93; Hungary 3.01; Ireland 2.93; Poland 2.70; Bulgaria 0.89; Czechoslovakia 0.76;

— *Commercial and business administration* — Cyprus 35.00; Malta 23.74; Belgium 22.40; Norway 17.87; Ireland 17. 61; Austria 15.70; Poland 14.83; Canada 14.17; the United Kingdom 13.98; Greece 13.21; Bulgaria 13.09; Iceland 12.97; Czechoslovakia 11.96; Turkey 11.44; Sweden 9.82; Finland 9.55; Switzerland 9. 12; the GDR 8.92; Portugal 7.85; France 7.20; Hungary 6.99; Denmark 6.89; the Netherlands 5.96; Spain 4.39; the FRG 2.05; Yugoslavia 1.45; Italy 1.34;

— *Mass communication and documentation* — Spain 1.88; Iceland 1.63; Austria 1.49; Denmark 1.35; Canada 1.17; Turkey 1.10; the Netherlands 0.93; Portugal 0.86; Sweden 0.86; Ireland 0.72; the GDR 0.63; Poland 0.62; Czechoslovakia 0.61; Norway 0.61; France 0.52; the FRG 0.50; Bulgaria 0.39; Greece 0.34; Finland 0.22; Belgium 0.16; Yugoslavia 0.09; Switzerland 0.05; Italy 0.01;

— *Home economics (domestic science)* — Switzerland 1.36; the FRG 1.02; the Netherlands 0.52; Canada 0.45; Finland 0.42; Ireland 0.25; France 0.24; Greece 0.20; Sweden 0.17; Turkey 0.14; Portugal 0.11; Austria 0.09; Poland 0.09; Yugoslavia 0.08; Norway 0.05;

— *Service trades* — Cyprus 7.22; Yugoslavia 1.34; Greece 1.27; Spain 1.24; Hungary 0.83; Bulgaria 0.81; Turkey 0.81; the GDR 0.78; Austria 0.40; the Netherlands 0.33; Canada 0.26; Finland 0.21; Denmark 0.16; Sweden 0.08; Norway 0.04; the FRG 0.03;

— *Natural science* — Ireland 13.48; France 12.65; the United Kingdom 8.88; Switzerland 8.39; the FRG 7.55; Norway 6.89; Italy 6.73; Spain 6.73: Finland 6.56; Austria 5.58; Greece 5.46; Bulgaria 5.31; Israel 5.06; Iceland 4.99; Yugoslavia 4.60; Turkey 3.69; Sweden 3.41; Poland 3.21; Canada 3.15; the Netherlands 3.01; Portugal 2.44; the GDR 1.65; Czechoslovakia 1.56; Hungary 1.16;

— *Mathematics and computer science* — Cyprus 7.28; Finland 6.06; Sweden 4.51; Israel 4.43; Greece 4.17; Canada 3.99; the FRG 3.96; the United Kingdom 3.79; Iceland 3.76; Austria 3.62; Denmark 3.41; Italy 3.37; Spain 2.99; France 2.93; Switzerland 2.34; Bulgaria 2.30; Ireland 2.19; Turkey 1.77; Czechoslovakia 1.62; Norway 1.34; Poland 1.24; the GDR 1.10; Hungary 1.08; the Netherlands 0.65;

— *Medical science and health-related sciences* — Malta 25.71; Italy 19.50; Belgium 17.33; Denmark 16.24; France 15.96; the United Kingdom 15.80; the GDR 14. 24; the FRG 14.18; Poland 13.52; Finland 12.77; Greece 12.37; Austria 12.32; Romania 11.79; Sweden 11.77; Norway 11.47; Bulgaria 11.09; Spain 10.97; the Netherlands 10.49; Hungary 9.98; Portugal 9.86; Turkey 9.36; Switzerland 9.31; Yugoslavia 8.66; the USSR 7.30; Czechoslovakia 7.13; Canada 1.73; Cyprus 6.77; Luxemburg 6.52; Israel 6.43; Ireland 6.20; Albania 4.93;

— *Engineering* — Czechoslovakia 40.43; Bulgaria 31.64; Luxemburg 30.37; Sweden 26.97; Yugoslavia 26.05; Finland 23.53; Albania 22.23; the GDR

19.84; Ireland 19.65; Turkey 18.33; Portugal 17.98; Cyprus 16.94; the FRG 16.68; Greece 16.64; Poland 15.73; Switzerland 15.16; Malta 13.77; Norway 12.82; Denmark 11.70; Belgium 10.68; Spain 10.01; Hungary 9.32; Italy 8.20; Austria 7.90; Canada 7.50; Iceland 7.29; the Netherlands 5.58; France 3.29;

— *Architecture and town planning* — Malta 7.80; Italy 5.48; Hungary 4.52; Spain 2.92; the FRG 2.88; Austria 2.41; Ireland 2.33; Denmark 2.01; Switzerland 1.94; Turkey 1.78; Portugal 1.69; the United Kingdom 1.46; Yugoslavia 1.35; France 1.21; Finland 1.15; Poland 0.85; Greece 0.84; Canada 0.76; Norway 0.66; Sweden 0.62; Czechoslovakia 0.61; Bulgaria 0.51; the GDR 0.3; Belgium 0.12;

— *Trade, craft and industrial programmes* — the GDR 11.06; the Netherlands 9.81; Hungary 6.36; Cyprus 4.91; France 4.04; Belgium 3.68; Poland 2.88; Switzerland 2.53; Iceland 0.92; Denmark 0.86; Yugoslavia 0.54; Sweden 0.50; Ireland 0.45; Greece 0.39; the FRG 0.38; Norway 0.25; Turkey 0.24; Portugal 0.20;

— *Transport and communication* — Czechoslovakia 2.45; Yugoslavia 2.42; Romania 2.16; Hungary 1.40; Bulgaria 1.30; Denmark 1.01; the Netherlands 0.98; Norway 0.94; the GDR 0.93; Poland 0.83; Greece 0.74; Sweden 0.28; the United Kingdom 0.24; Cyprus 0.22; France 0.12; Canada 0.10; Belgium 0.07; Finland 0.07; Switzerland 0.02; Turkey 0.01;

— *Agriculture, forestry and fishery* — Albania 27.03; the USSR 10.35; Czechoslovakia 9.35; Poland 7.87; Yugoslavia 7.19; Hungary 6.08; the GDR 5.48; Bulgaria 5.13; Greece 4.70; Romania 4.38; the Netherlands 3.71; Turkey 3.62; Italy 3.30; Finland 3.24; Austria 3.22; Portugal 3.18; the FRG 2.92; Denmark 2.43; Switzerland 2.22; Belgium 2.04; Ireland 1.75; Spain 1.50; Canada 1.49; Norway 1.23; Israel 1.16; Cyprus 1.15; Sweden 1.13; the United Kingdom 0.87; France 0.79; Iceland 0.77;

— *Other and not specified* — Canada 36.28; the GDR 12.88; the United Kingdom 7.67; Norway 7.56; Cyprus 7.37; Spain 4.27; Ireland 4.17; Portugal 3.96; Sweden 3.53; the Netherlands 3.23; Denmark 3.18; France 2.79; Poland 2.78; Austria 2.43; Albania 2.32; the FRG 1.62; Italy 1.60; Belgium 1.55; Israel 1.45; Yugoslavia 0.90; Hungary 0.69; Czechoslovakia 0.32; Finland 0.28.

Given the fact that for certain countries the available statistics refer to ***data covering several fields*** and bearing in mind the general priorities given to the fields of study in higher education, it would be useful to organise the data into large groups of programmes. Thus, Group I covers the ***Sciences of man and society*** with the fields: Education science and teacher training; Humanities, religion and theology; Fine and applied arts; Law; Social and behavioural science; Commercial and business administration; Mass communication and documentation; Home economics; Service trades); Group II covers ***Natural science, mathematics and computer science;*** Group III covers ***Medical science and health-related;*** Group IV ***Predominantly technical fields*** (Engineering; Architecture and town planning; Trade, craft and industrial programmes; Transport and communications; Agriculture, forestry and fishery); and Group V covers ***Other and not specified fields of study.*** Based on the most recent data available — the years mentioned above — the following percentage distribution can be observed presented here in decreasing order (%):

— *Group I* (Sciences of man and society): the Netherlands 62.54; Austria 62.52; Israel 61.92; Turkey 61.14; Iceland 60.88; Spain 60.61; Hungary 59.39;

Portugal 58.37; Switzerland 58.09; Norway 56.84; France 56.32; Belgium 56.31; Denmark 55.72; Cyprus 55.46; Greece 54.69; Luxemburg 54.45; Malta 52.72; Italy 51.82; Poland 51.09; the FRG 49.83; Ireland 49.78; Yugoslavia 48.29; Sweden 47.28; Finland 46.34; the United Kingdom 45.39; Bulgaria 42.72; Canada 40.06; Albania 38.47; the USSR 37.91; Czechoslovakia 36.73; the GDR 32.52; Romania 16.29;

— *Group II* (Natural science, mathematics, and computer science): Ireland 15.67; France 15.58; the United Kingdom 12.67; Finland 12.62; the FRG 11.51; Switzerland 10.73; Italy 10.10; Spain 9.72; Greece 9.63; Israel 9.49; Austria 9.20; Iceland 8.75; Luxemburg 8.66; Norway 8.23; Belgium 8.22; Sweden 7.92; Bulgaria 7.61; Cyprus 7.28; Canada 7.14; Denmark 6.85; Turkey 5.46; Romania 5.10. Albania 5.02; Portugal 4.76; Yugoslavia 4.60; Poland 4.45; the Netherlands 3.66; Czechoslovakia 3.18; the GDR 2.75; Hungary 2.24;

— *Group IV* (Predominantly technical fields): Romania 66.82; the USSR 54.79; Czechoslovakia 52.64; Albania 49.26; Bulgaria 38.58; the GDR 37.61; Yugoslavia 37.55; Luxemburg 30.37; Sweden 29.50; Poland 28.16; Finland 27.99; Hungary 27.70; Ireland 24.18; Turkey 24.04; Greece 23.31; Cyprus 23.22; Portugal 23.05; the FRG 22.86; Switzerland 21.87; Malta 21.57; Israel 20.71; the Netherlands 20.08; the United Kingdom 18.47; Denmark 18.01; Italy 16.98; Belgium 16.59; Norway 15.90; Spain 14.43; Austria 13.53; Canada 9.85; France 9.45; Iceland 8.96;

— *Groups III* and *V* are presented in the previous categorisation as they only refer to a single field of study.

To gain a picture of the *evolution* of the priorities in higher education in the countries of the Europe Region referring to the *percentage distribution of the different programmes and fields of study*, it would be useful to make a comparative analysis of the 1980 and 1985 data (as presented in Table 2.2.), with exceptions where only data relating to other years can be used. The comparison is made according to groups of fields or programmes since, over the years, national statistics do not always allocate the programmes to the same fields or they are often presented in groups (combining several fields, often in a different way from one year to another). On the basis of the data presented in Table 2.2., one can observe the following evolutions:

— in *Group I* (related to sciences of man and society) significant increases are recorded in 9 countries (Belgium, Cyprus, Hungary, Iceland, Luxemburg, Poland, Sweden, Switzerland, and Turkey) and smaller ones in 8 countries (Albania, Austria, Greece, Israel, Italy, Norway, Spain, and the USSR); important decreases are witnessed in 5 countries (Canada, Denmark, Malta, the United Kingdom, and Yugoslavia) and smaller decreases in 9 countries (Bulgaria, Czechoslovakia, Finland, the GDR, the FRG, Ireland, the Netherlands, Portugal, and Romania); no data are available for France and the United States of America;

— in *Group II* (Natural science, mathematics and computer science) significant increases are recorded in 6 countries (Canada, Finland, Iceland, Luxemburg, Portugal, and Sweden) and smaller ones in 17 countries (Albania, Austria, Bulgaria, Czechoslovakia, Denmark, France, the GDR, the FRG, Ireland, Israel, Italy, Norway, Poland, Romania, Spain, Switzerland, and Yugoslavia); large decreases can be seen in 3 countries (Belgium, Greece, and the United Kingdom) and less important decreases in 3 countries (Hungary,

Table 2.2.

The evolution of student distribution by groups of fields or groups of programmes of study

(%)

Country	Years		Groups of fields (of programmes)									
			I		II		III		IV		V	
Albania	1980;	1985	37.12;	38.47	4.37;	5.02	5.56;	4.93	50.15;	49.26	2.80;	2.32
Austria	1980;	1985	61.80;	62.52	9.06;	9.20	14.31;	12.32	12.94;	13.53	1.89;	2.43
Belgium	1980;	1985	48.55;	56.31	10.13;	8.22	27.25;	17.33	13.46;	16.59	0.61;	1.55
Bulgaria	1980;	1985	43.25;	42.72	6.21;	7.61	15.25;	11.09	35.29;	38.58	— ;	—
Canada	1980;	1985	52.89;	40.06	5.72;	7.14	7.19;	6.67	11.75;	9.85	22.45;	36.28
Cyprus	1980;	1985	46.39;	55.46	— ;	7.28	12.99;	6.67	40.62;	23.22	— ;	7.37
Czechoslovakia	1980;	1985	36.89;	36.73	3.17;	3.18	7.90;	7.13	51.66;	52.64	0.38;	0.32
Denmark	1980;	1984	60.20;	55.72	6.24;	6.85	16.58;	16.24	14.98;	18.01	2.00;	3.18
Finland	1980;	1985	49.18;	46.34	10.68;	12.62	10.69;	12.77	28.33;	27.99	1.12;	0.28
France	1980;	1982	. . . ;	56.32	14.99;	15.58	21.80;	15.86	. . . ;	9.45	7.25;	2.79
German Dem. Rep.	1980;	1985	34.25;	32.52	2.36;	2.75	15.31;	14.24	25.45;	37.61	22.63;	12.88
Germany, Fed. Rep. of	1980;	1985	50.89;	49.83	11.19;	11.91	15.11;	14.18	20.63;	22.86	2.18;	1.62
Greece	1980;	1983	53.34;	54.69	11.02;	9.63	10.94;	12.37	23.81;	23.31	0.89;	—
Hungary	1980;	1985	54.70;	59.39	2.59;	2.24	9.09;	9.98	32.97;	27.70	0.65;	0,69
Iceland	1980;	1983	47.69;	60.88	6.06;	8.75	18.45;	21.41	25.87;	8.96	1.93;	—
Ireland	1980;	1982	51.23;	49.78	14.13;	15.67	7.31;	6.20	22.54;	24.18	4.79;	4.17
Israel	1980;	1984	60.45;	61.92	8.94;	9.49	6.70;	6.43	21.89;	20.71	2.02;	1.45
Italy	1980;	1984	50.41;	51.82	9.67;	10.10	22.14;	19.50	16.95;	16.98	0.03;	1.60
Luxemburg	1980;	1984	44.65;	54.45	4.54;	8.66	13.24;	6.52	29.55;	30.37	8.02;	—
Malta	1980;	1985	64.84;	52.72	0.42;	—	23.76;	25.71	10.98;	21.57	— ;	—
Netherlands	1980;	1984	63.51;	62.54	3.89;	3.66	10.25;	10.49	18.81;	20.08	3.54;	3.23
Norway	1981;	1984	55.15;	56.84	7.09;	8.23	13.02;	11.47	16.80;	15.90	7.94;	7.56
Poland	1980;	1985	44.72;	51.09	3.39;	4.45	10.58;	13.52	39.02;	28.16	2.29;	2.78
Portugal	1980;	1984	59.21;	58.37	0.17;	4.76	14.91;	9.86	21.73;	23.05	3.98;	3.96
Romania	1980;	1985	19.20;	16.29	4.37;	5.10	12.13;	11.79	64.30;	66.82	— ;	—
Spain	1980;	1984	56.73;	60.61	8.76;	9.72	15.75;	10.97	15.38;	14.43	3.38;	4.27
Sweden	1978;	1984	23.96;	47.28	1.96;	7.92	10.64;	11.77	24.39;	29.50	39.05;	3.53
Switzerland	1980;	1985	53.46;	58.09	10.64;	10.73	11.58;	9.31	22.39;	21.87	1.93;	—
Turkey	1980;	1984	53.04;	61.14	6.70;	5.46	10.98;	9.36	28.62;	24.04	0.66;	—
United Kingdom	1980;	1983	54.56;	45.39	16.44;	12.67	6.32;	15.80	22.04;	18.47	0.64;	7.67
USSR	1980;	1985	36.94;	37.91	— ;	—	7.23;	7.30	55.83;	54.79	— ;	—
Yugoslavia	1980;	1984	59.68;	48.29	3.61;	4.60	7.22;	8.66	28.15;	37.55	1.34;	0.90

the Netherlands and Turkey); no comparable data are available for Cyprus and Malta, and no data at all are available for the United States of America;

— in *Group III* (Medical science and health-related sciences) significant increases are recorded in 3 countries (Greece, Iceland, and Poland) and smaller increases in 8 countries (Finland, Hungary, Malta, the Netherlands, Sweden, the United Kingdom, the USSR, and Yugoslavia); more important decreases are seen in 10 countries (Belgium, Bulgaria, Cyprus, France, Italy, Luxemburg, Norway, Portugal, Spain, and Switzerland), and smaller decreases in 11 countries (Albania, Austria, Canada, Czechoslovakia, Denmark, the GDR, the FRG, Ireland, Israel, Romania, and Turkey); no data are available for the United States of America;

— in *Group IV* (the predominantly technical ones) important increases can be seen in 7 countries (Belgium, Bulgaria, Denmark, the GDR, Malta, Sweden, and Yugoslavia) and smaller increases in 9 countries (Austria, Czechoslovakia, the FRG, Ireland, Italy, Luxemburg, the Netherlands, Portugal, and Romania); significant decreases are recorded in 6 countries (Cyprus, Hungary, Iceland, Poland, Turkey, and the United Kingdom), and smaller decreases in 9 countries (Albania, Canada, Finland, Greece, Israel, Norway, Spain, Switzerland, the USSR); no data are available for France and the United States;

— in *Group V* (Other and not specified) important increases are evident in 4 countries (Belgium, Canada, Denmark, and the United Kingdom) and smaller increases in 5 countries (Austria, Hungary, Italy, Poland, and Spain); significant decreases can be seen in 4 countries (Finland, France, the GDR, and Sweden) and smaller decreases in 9 countries (Albania, Czechoslovakia, the FRG, Ireland, Israel, the Netherlands, Norway, Portugal, and Yugoslavia); there are no comparable data available for 6 countries (Cyprus, Greece, Iceland, Luxemburg, Switzerland, and Turkey); no data at all are available for the United States. In the case of 4 countries, (Bulgaria, Malta, Romania, and the USSR) no programmes are mentioned uuder this category.

For a faithful reflection of the situation, some specifications should be made (as they are reflected in the statistical data): the 1985 data for *Austria* include the students enrolled simultaneously in several fields; the 1980 data for *Belgium* only relate to universities and institutions granting equivalent degrees; the 1985 data for *Canada* do not include 114,965 part-time students and their distribution by fields of study is not known; the data for *France* relate only to universities in 1980 but to the entire higher educational system in 1985. Furthermore, the distribution of the programmes by fields of study cannot always be made according to ISCED (the field of *Humanities, religion and theology* also includes most of the programmes in the social sciences, except for Economics; the field of *Natural science* also includes some programmes belonging to the field of *Engineering*, and the category *Other and not specified* relates to technological university establishments, also including *Service trades);* the data for the United Kingdom include the students enrolled in the "Open University", furthermore, the 1980 figures included students enrolled simultaneously in several fields of study; for the USSR the data relating to Medical science and health-related sciences also include physical education and sports.

Moreover, one must be cautious when making comparisons using the data based on the distribution between fields of study within higher education for the *FRG* and *Sweden*, as some programmes included in 1980 and 1978, respectively, in the category *Other and not specified* are subsequently allocated into different categories; also, we cannot assume that *the USSR* has no trainees in the fields of Natural science, Mathematics and computer science, but their numbers are probably included in other fields and the fact is not mentioned in the statistical yearbook.

2.3 Student distribution by levels and fields of study

One meets particular difficulties in attempting to compare data on student distribution by levels and fields of study between data years for one or more given countries of the Europe Region. It is even more difficult — and largely irrelevant — to make comparisons between given years. As we have observed from the available information, in numerous national statistics the data referring to the programmes of study are allocated differently from year to year, both across the fields and across the levels, which renders comparison between data years for a given country impossible; consequently, they cannot be compared internationally. Taking these facts into consideration, our attention will mostly focus on the most recent data (as a rule, those of 1985, with the exception of the following: 10 countries — Denmark, Israel, Italy, Luxemburg, the Netherlands, Norway, Portugal, Spain, Turkey, and Yugoslavia — for which the 1984 data have been used; 2 countries — Greece and the United Kingdom — 1983 data; 2 countries — France and Ireland — 1982 data; the lastest data available for Sweden, referring to these classifications, are those of 1978), which, taken separately, will help construct a picture of the whole, as far as possible; comparisons between given data years will be only made when it is relevant and realistically possible (where the base year will be taken as 1980 — with the exception of Norway, in which case 1981 is used — and the last year as 1985 — with exceptions mentioned above). All these aspects will be presented for each field in the following.

Education science and teacher training

— At level 5, the above category accounts for the following percentages of the total enrolments in the latest available data year; the countries are listed in decreasing order (%): Cyprus 100; Greece 100; Luxemburg 100; the Netherlands 100; Belgium 80.23; Switzerland 69.64; Yugoslavia 64.15; Sweden 63.68; Israel 56.95; Austria 56.25; Portugal 54.60; France 50.48; Denmark 47.37; Bulgaria 45.39; Hungary 43.06; Poland 33.66; the FRG 27.96; Turkey 27.44; the United Kingdom 25.91; Finland 19.25; Canada 8.85; Ireland 7.12; Italy 6.62; Norway 5.24. No programmes are offered in this field at level 5 in Albania, Czechoslovakia, the GDR, Malta, and Romania. (There are no available data for Iceland, the United States, and the USSR concerning all levels and fields of study);

— at level 6, the following percentages can be observed: Albania 100; Czechoslovakia 100; Malta 100; Romania 100 (the data also include other fields); Norway 92.29; Italy 90.03; Finland 79.21; Canada 71.60; Turkey 70.92; the FRG 69.91; Poland 62.27; Ireland 62.15; Bulgaria 54.32; Denmark 52.63; the GDR 46.40; Portugal 45.08; the United Kingdom 44.93; Austria 39.95; Hungary 36.83; Sweden 36.32; Yugoslavia 35.85; Israel 31.94 (the data also include other fields); France 31.47; Spain 31.43; Switzerland 26.68; Belgium 19.77. There are no programmes at level 6 in this field in Cyprus, Greece and the Netherlands;

— at level 7, the percentages are as follows; the GDR 53.60; Ireland 30.73; the United Kingdom 29.16; Hungary 20.11; Canada 19.55; France 18.05; Israel (also including other fields) 11.11; Switzerland 3.68; Italy 3.35; Poland 3.07; Norway 2.47; the FRG 2.13; Austria 1.80; Turkey 1.64; Finland 1.54; Portugal 0.32; Bulgaria 0.29. The countries not mentioned above do not offer programmes at this level or have not submitted the respective data.

Concerning the evolution of the percentages, the following points are worthy of mention: increases are recorded at level 5 in Canada (from 0.70 to 8.85;) Denmark (37.36; 47.37); Hungary (39.68; 43.06); Poland (27.28;33.66); Portugal (41.75; 54.60); Switzerland (67.18; 69.64) and the United Kingdom (24.77); 25.91); decreases are recorded in Austria (from 76.51 to 58.25); Finland (26.25; 19.25); Ireland (8.28; 7.12); Spain (74.45; 68.57) and Turkey (34.95; 27.44). Increases are recorded at level 6 in Austria (from 22.53 to 39.93); Finland (73.77; 79.21); the FRG (68.59; 69.61); Malta (80.37; 100.00); Norway (70.14; 92.29); Spain (25.55; 31.43); Turkey 65.05; 70.92) and Yugoslavia (31.81; 35.85), while decreases are recorded in Canada (from 80.23 to 71.60); Denmark 62.64; 52.63); the GDR (48.42; 46.40); Hungary (37.62; 36.83); Portugal 58.25; 45.08); Switzerland (29.84; 26.68) and the United Kingdom (47.65; 44.93). At level 7 there are increases in Austria (from 0.96 to 1.80); Canada (19.07; 19.55); Finland (0.58; 1.54); Switzerland (2.98; 3.68) and the United Kingdom (27.58; 29.16), and decreases in the FRG (from 2.25 to 2.13) and Hungary (22.70; 20.11).

Humanities, religion and theology

The most recent data available referring to level 5 of the above field reveal the following percentage distribution: Luxemburg 100; Norway 46.81; Denmark 17.72; Ireland 13.78; Switzerland 5.62; the United Kingdom 5.14; Bulgaria 4.26; Greece 2.02; the Netherlands 1.54; the FRG 1.46; Sweden 1.33; Spain 0.96; Austria 0.39; France 0.09. No programmes are offered in this field at level 5 in: Belgium, Finland, the GDR, Hungary, Italy, Malta, Portugal, Romania, Turkey, and Yugoslavia. There are no available data for Canada, Cyprus, Iceland, Israel, the United States of America and the USSR;

— at level 6, the following percentages are recorded: Albania 100; Belgium 100; Czechoslovakia 100; Yugoslavia 100; Portugal 99.06; Spain 99.04; Italy 98.92; the Netherlands 98.46; Greece 97.98; the FRG 96.33; Austria 95.97; Belgium 94.75; Turkey 94.49; Finland 92.98; Poland 89.85; France 89.59; the United Kingdom 83.85; Switzerland 83.09; Denmark 82.28; Canada 61.33; Ireland 80.43; Hungary 29.90; Sweden 27.98; Norway 17.28; the GDR 13.18. There are no programmes in this field at level 6 in: Malta, and there are no available data for Cyprus, Iceland, Israel, Romania, the United States of America and the USSR;

— at level 7 the following percentages are recorded: Malta 100; the GDR 86.14; Hungary 71.10; Sweden 70.69; Norway 35.91; Canada 18.67; Switzerland 11.29; the United Kingdom 11.01; France 10.32; Poland 10.15; Finland 7.02; Ireland 5.79; Turkey 5.51; Austria 3.64; the FRG 2.21; Italy 1.08; Bulgaria 0.99; Portugal 0.94; There are no programmes offered at this level in: Albania, Czechoslovakia, Cyprus, Luxemburg, Romania and Yugoslavia. No data are available for Belgium, Denmark, Greece, Iceland, Israel, the Netherlands, Spain, the United States of America and the USSR.

The following points can be made with respect to the evolution of the above: at level 5, increases are recorded in Austria (from 0.25 to 0.39); Bulgaria (4.00; 4.26); Denmark (12.42; 17.72); the FRG (1.13; 1.46); Ireland (10.59; 13.68) and Norway (33.06; 46.81), while decreases are recorded in Greece (from 3.03 to 2.02); Spain (1.35; 0.96); Switzerland (11.98; 5.62) and the United Kingdom (7.26; 5.14). There are increases at level 6 in: France (from 85.19 to 89.59); Greece (96.97; 97.98); Hungary (22.13; 28.90); Italy (97.65; 98.92); Spain (98.65; 99.04); Switzerland (79.31; 83.09) and the United Kingdom (81.57; 83.85), and decreases in Austria (from 99.32 to 95.97); Bulgaria (96.00; 94.75); Denmark (87.58; 82.28); Finland (93.72; 92.98); the GDR (88.53; 86.14); the FRG (97.44; 96.33); Ireland (82.81; 80.43); and Norway (26.04; 17.28). At level 7, increases are recorded in: Austria (from 0.43 to 3.68); Finland (6.28; 7.02); the FRG (1.43; 2.31) and Switzerland (8.71; 11.29); decreases in: France (from 14.81 to 10.32), the GDR (88.53; 86.14); Hungary (77.87; 71.10); Ireland (6.60; 5.79); Italy (2.35; 1.08) and Norway 40.90; 35.91).

Fine and applied arts

— At level 5, the following percentages are recorded for the field above: the Netherlands 100.00; Ireland 84.46; Greece 71.57; Belgium 65.76; Sweden 64.17; Switzerland 62.72; Italy 62.05; Norway 49.87; Canada 43.19; Finland 42.60; Denmark 24.14; the United Kingdom 20.31; Hungary 17.26; Turkey 9.57; Poland 5.54; the FRG 5.42; France 5.09; the GDR 3.95; Spain 0.78; Bulgaria 0.37. There are no programmes offered at level 5 in: Albania, Austria, Czechoslovakia, Luxemburg, Malta, Portugal, Romania and Yugoslavia. No data are available for Cyprus, Iceland, Israel, the United States, and the USSR;

— at level 6, the percentages are as follows: Albania 100; Czechoslovakia 100; Portugal 100; Romania 100; Yugoslavia 100; Austria 99.71; Spain 99.222; Bulgaria 98.02; France 94.91; the FRG 93.91; Poland 92.72; Turkey 81.58; Denmark 75.86; the United Kingdom 73.12; Finland 55.88; Canada 52.59; Norway 46.87; Italy 37.95; Sweden 35.83; Belgium 34.24; Switzerland 33.50; Greece 28.43; the GDR 22.02; Ireland 14.53. No programmes are offered in this field at level 6 in: Hungary, Malta, and the Netherlands. There are no available data for Iceland, the United States and the USSR;

— at level 7, the latest recorded percentages are: Hungary 82.74; the GDR 74.03; Turkey 8.85; the United Kingdom 6.57; Canada 4.22; Switzerland 3.78; Norway 3.26; Bulgaria 1.61; Finland 1.52; Ireland 1.41; Poland 0.74; the FRG 0.67; Austria 0.29. In this field of study, no programmes are offered at this level in the following countries: Albania, Czechoslovakia, France, Italy, the Netherlands, Portugal, Romania and Yugoslavia. There are no available data for Denmark, Greece, Iceland, Israel, Spain, the United States of America and the USSR.

Comparison between the data years reveals the following, more significant aspects as far as the evolution of the percentages is concerned: at level 5, increases are recorded in Finland (from 34.12. to 42.60); Ireland (79.01; 84.46); Norway (43.90; 49.87); Switzerland (43.91; 62. 72) and the United

Kingdom (8.57; 20.31), while decreases are recorded in Bulgaria (from 13.47 to 0.07); Denmark (26.91; 24.14); the FRG (5.60; 5.42); Greece (72.98; 71.57); Italy (65.85; 62.05); Poland (6.44; 5.54) and Spain (1.01; 0.78). At level 6, there are increases in Bulgaria (from 86.53 to 98.02); Canada (51.98; 52.59); Denmark (73.099; 75.86); Greece (27.72; 28.43); Italy (34.15; 37.95) and Spain (98.99; 99.22), but decreases in Finland (from 65. 32 to 55.88); the GDR (29.05; 22.02); Ireland (19.36; 14.13); Norway (54. 37; 46.87); Switzerland (52.48; 33.50) and the United Kingdom (85.81; 73.12). At level 7, increases can be observed in Canada (from 4.14 to 4.22); Finland (0.56; 1.52); the GDR (70.95; 74.03); Norway (1.73; 3.26); Switzerland (3.61; 3.78) and the United Kingdom (5.62; 6.57), and decreases in the FRG (from 0.87 to 0.67) and Ireland (1.63; 1.41).

Law

— At level 5 the following percentages can be observed in this field (according to the most recently available data): Luxemburg 100; Hungary 24.50; France 15.92; the United Kingdom 7.66; Turkey 4.30; Yugoslavia 2.56; Belgium 0.47; Ireland 0.29 and Switzerland 0.08. At level 5 no programmes are offered in this field in Albania, Austria, Bulgaria, Canada, Czechoslovakia, Denmark, Finland, the GDR, the FRG, Greece, Israel, Italy, Malta, the Netherlands, Norway, Poland, Portugal, Romania and Spain. There are no available data for Cyprus, Iceland, Sweden, the United States of America and the USSR;

— at level 6, the following percentages are recorded: Albania 100; Czechoslovakia 100; Denmark 100; Greece 100; Malta 100; Romania 100; Spain 100; Belgium 99.53; Poland 99.52; Portugal 99.27; Italy 99.21; Austria 99.10; the FRG 98.74; Bulgaria 98.00; Yugoslavia 97.44; Finland 95.40; Turkey 94.36; Sweden 94.32; Canada 92.83; Israel 92.19; the United Kingdom 83.21; Switzerland 83.14; Ireland 79.15; France 72.73. No programmes are offered in this field at level 6 in the GDR, Hungary and Norway. There are no data available for Iceland, the United States of America and the USSR;

— at level 7, the percentages are as follows: the GDR 100; Norway 100; Hungary 75.50; Ireland 20.56; Switzerland 16.78; France 11.35; the United Kingdom 9.13; Israel 7.81; Finland 4.60; Bulgaria 2.00; Turkey 1.34; the FRG 1.26; Austria 0.90; Italy 0.79; Portugal 0.73; Poland 0.48. There are no such programmes offered in Albania, Cyprus, Czechoslovakia, Denmark, Luxemburg, Malta, the Netherlands, Romania and Yugoslavia. There are no available data for Belgium, Greece, Iceland, Spain, the United States of America and the USSR.

The main characteristics of the evolution of these percentages are revealed by the following data: at level 5, increases can be observed in France (from 15.71 to 15.92); Turkey (3.79; 4.30) and Yugoslavia (1.66; 2.56), while decreases are observed in Hungary (from 29.96 to 24.50); Ireland (1.18; 0.29); Switzerland (0.94; 0.08) and the United Kingdom (11.43; 7.66). At level 6, there are increases in Canada (from 92.37 to 92.83); Finland (91.93; 95.40); France (70.71; 72.73); Ireland (78.84; 79.15); Italy (98.57; 99.21) and the United Kingdom (80.12; 83.21), but decreases in the FRG (from 98.80 to 98.74); Portugal (99.80; 99.27); Switzerland (85.27; 83.14); Turkey (96.21; 94.36) and Yugoslavia (98.34; 97.44). At level 7, there are increases in the FRG (from 1.18 to 1.26); Hungary (70.04; 75.50); Ireland (19.98, ; 20.56); Switzerland (13.79; 16.78) and the United Kingdom (8.45; 9.13) and decreases in Canada (from 7.63 to 7.17); Finland (8.907; 4.60); France (13.58; 11.35) and Italy (1.43; 0.79).

Social and behavioural science

From the latest data for this field at level 5 we can observe the following percentages: Luxemburg 100; Belgium 44.84; the Netherlands 40.86; Norway 37.26; Canada 20.68; Switzerland 16.85; Yugoslavia 16.57; Israel 13.57; the United Kingdom 10.94; Austria 3.72; Ireland 1.76; France 1.32; Turkey 1.09; Denmark 0.24. No programmes are offered at this level in Albania, Bulgaria, Czechoslovakia, Finland, the GDR, the FRG, Hungary, Italy, Malta, Poland, Portugal, Romania and Spain. No data are available for Cyprus, Iceland, the United States and the USSR;

— at level 6, the following percentages are recorded for this field of study: Albania 100; Czechoslovakia 100; Romania 100; Spain 100; Italy 99.83; Denmark 99.76; the FRG 98.59; Portugal 98.16; Greece 98. 86; Poland 96.43; Turkey 95.88; Austria 93. 74; Finland 90.93; France 83.65; Yugoslavia 83.43; the United Kingdom 74.76; Ireland 73.99; Switzerland 70.13; Canada 68.99; Israel 62.76; the Netherlands 59.14; Belgium 55.16; Bulgaria 51.88; the GDR 50.52; Sweden 39.30; Norway 14.61. No programmes are offered in this field at level 6 in Hungary, Malta and Switzerland. No data are available for Cyprus, Iceland, the United States and the USSR;

— at level 7, the following percentages are recorded: Hungary 100; Sweden 60.70; the GDR 49.48; Norway 48. 13; Bulgaria 48.12; Ireland 24.25; Israel 23.67; France 15.03; the United Kingdom 14.13; Switzerland 23.02; Canada 10.33; Finland 9.07; Sweden 5.68; Poland 3.57; Turkey 3.03; Austria 2.57; Portugal 1.84; the FRG 1.41; Italy 0.17. At level 7, no programmes are offered in this field in Albania, Cyprus, Czechoslovakia, Denmark, Malta, the Netherlands, Romania and Yugoslavia. No data are available for Belgium, Greece, Iceland, Spain, the United States and the USSR.

The following points may be observed relating to the above percentages; at level 5, increases are seen in: Greece (from 3.82 to 6.14); Norway (32.45; 37.26); Switzerland (2.44; 16.85) and the United Kingdom (6.32; 10.94), while decreases are evident in Austria (from 4.78 to 3.72); Canada (25.50; 10.68); Turkey (9.65; 1.09) and Yugoslavia (25.90; 16.57). At level 6, there are increases in Canada (from 63.18 to 68.99); France (82.08; 83.65); the GDR (48.31; 50.52); the FRG (97.86; 98.59); Turkey (90.35; 95.88) and Yugoslavia (74.10; 83.43), but decreases in Austria (from 94.00 to 93.74); Bulgaria (57. 70; 51.88); Finland (91.16; 90.93); Greece (96.18; 93.86); Ireland (81.18; 73.99); Norway (16.49; 14.61); Switzerland (82.81; 70.13) and the United Kingdom (81.92; 74.76). At level 7, increases are evident in Austria (from 1.22 to 2.54); Bulgaria; (42.30; 48.12); Finland (8.84; 9.07); Ireland (18.82; 24.25); Norway (51.06 48.13) and the United Kingdom (11.76; 14.13), but decreases may be observed in Canada (from 11.32 to 10.33); France (17.92; 15.03); the GDR (51.68; 49.48); the FRG (2.14; 1.41) and Switzerland (14.75; 13.02).

The data relating to Israel and Romania also include other fields (Commercial and Business Administration; Mass communication and documentation; Home economics; Service trades).

Commercial and business administration

According to the latest data available, the following percentages of student enrolment are to be found in this field at level 5: Cyprus 100; Spain 100; Switzerland 100; the Netherlands 88.50; Hungary 79.67; France 72.57; Norway 71.74; Ireland 62.09; the United Kingdom 61.63; Belgium 60.00; Canada 73.83; Greece 34.43; Poland 31.82; the FRG 28.39; Yugoslavia 27.93; Turkey 19.18; Sweden 15.54; Finland 11.07; Austria 7.62; Denmark 4.33; the GDR 1.11. No programmes are offered at this level in Albania, Bulgaria, Czechoslovakia, Italy, Malta, Portugal, and Romania. No data are available for Iceland, Israel, Luxemburg, the United States and the USSR;

— at level 6, the percentages recordeda are as follows: Bulgaria 100; Czechoslovakia 100; Italy 100; Malta 100; Portugal 99.06; Denmark 95.67; Austria 86.32; Finland 84.99; Sweden 84.46; Turkey 76.89; Yugoslavia 72.07; the FRG 71.56; Greece 65.57; the GDR 64.58; Canada 55.07; Poland 54.15; Belgium 40.00; Ireland 34.90; Norway 27.93; France 27.43; the United Kingdom 27.36; the Netherlands 11.50. No programmes are offered at level 6 in this field in Albania, Hungary, Spain and Switzerland. There are no available data for Iceland, Israel, Luxemburg, Romania, the United States, and the USSR;

— at level 7, there are few registrations in this field: the GDR 34.31; Hungary 20.33; Poland 13.96; the United Kingdom 11.01; Canada 7.10; Austria 5.06; Finland 3.94; Turkey 3.93; Ireland 3.01; Portugal 0.94; Norway 0.33 and the FRG 0.05. In 11 countries no such programmes are offered at this level in Albania, Bulgaria, Cyprus, Czechoslovakia, France, Italy, Malta, Romania, Spain, Switzerland and Yugoslavia, and for 10 countries there are no available data Belgium, Denmark, Greece, Iceland, Israel, Luxemburg, the Netherlands, Sweden, the United States and the USSR.

A study of the evolution of these percentages reveals the following points: at level 5, there are increases in Austria (from 4.85 to 7.62); Denmark (0.55; 4.33); Greece (25.86; 34.42); Ireland (56.53; 62.09); Norway (68.92; 71.74) and decreases in Canada (from 39.63 to 37.83); the FRG (30.41; 28. 39); Hungary (82.15; 79.67); Poland (37.36; 31.89); the United Kingdom (65.14; 61.63) and Yugoslavia (28.14; 27.93). At level 6, increases are recorded in Canada (from 52.40 to 55.07); the FRG (69.34; 71.56), the United Kigdom (24.78; 27.36) and Yugoslavia (71.86; 72.07) and decreases in Austria (from 89.25 to 87.32); Denmark (99.45; 95.67); the GDR (68.75; 64.58); Ireland (39.87; 34.90) and Norway (30.66; 27.93). At level 7, there are increases in Finland (from 1.60 to 3.94); the GDR (31.25; 34.31); Hungary (17.85; 20.33) and the United Kingdom (10.08; 11.01) and decreases in Austria (from 5.90 to 5.06); Canada (7.97; 7.10); Ireland (3.60; 3.01) and Norway (0.42; 0.33).

Mass communication and documentation

— At level 5, the following enrolment ratios are recorded for this field of study: Belgium 100; Greece 100; the Netherlands 100; Finland 98.92; France 90.23; Switzerland 86.44; Norway 65.03; the United Kingdom 56.93; Sweden 47.08; Canada 44.29; Ireland 38.83; Spain 4.07; Denmark 2.20. No programmes are offered at level 5 in this field in Austria, Bulgaria, Czechoslovakia, the GDR, the FRG, Italy, Poland, Portugal, Romania, Turkey, and

Yugoslavia. No data are available for Iceland, Israel, the United States and the USSR;

— at level 6, the following percentages are recorded: Czechoslovakia 100; Yugoslavia 100; Austria 99.79; Denmark 97.80; the FRG 97.40; Bulgaria 96.62; Poland 96.59; Spain 95.93; Turkey 94.18; Portugal 91.09; the GDR 62.65; Ireland 54.45; Sweden 52.92; Canada 44.06; the United Kigdom 34.30; Norway 33.39; Switzerland 10.17; France 9.77 and Finland 1.08. There are no educational programmes offered at level 6 in this field in Belgium, Czechoslovakia, Greece, Italy, the Netherlands and Romania. No data are available for Iceland, Israel, the United States of America and the USSR.

— at level 7, the percentages are as follows: Italy 100; the GDR 37.35; Canada 11.65; Portugal 8.91; the United Kigdom 8.77; Ireland 6.72; Turkey 5.82; Poland 3.49; Switzerland 3.39; Bulgaria 3.38; the FRG 2.60; Norway 1.58; Austria 0.21. There are no level-7 programmes offered in Belgium, Czechoslovakia, Finland, France, Greece, the Netherlands, and Yugoslavia. There are no data available for Denmark, Iceland, Israel, Spain, the United States and the USSR.

There are no programmes offered at any level in this field of study in Albania, Cyprus, Hungary, Luxemburg and Malta. In France, the numbers for the Service trades are also included in the registration for this field of study at level 6.

Within this field, the following points emerge from a study of the evolution of the percentages at each level: at level 5, increases can be observed in Denmark (from 1.62 to 2.20); Finland (76.89; 98.92) and the United Kingdom (20.65; 56.93) and decreases in Canada (from 45.56 to 44.29) and Ireland (74.24; 38.83). At level 6, there are increases in Canada (from 41.47 to 44.06); Ireland (21.21; 54.45); Portugal (84.91; 91.09); the United Kigdom (5.88; 34.30) and decreases in Denmark (from 98.39 to 97.80); Finland (23.11; 1.08); the GDR (70.00; 62.65) and the FRG (98.91; 97.40). At level 7 there are increases in the GDR (from 30.000 to 37.35); the FRG (1.09; 2.60); Ireland (4.55; 6.72), and decreases in Canada (from 12.97 to 11.65); Portugal (15.09; 8.91) and the United Kigdom (20.47; 8.77).

Home economics (domestic science)

— At level 5, only 10 of the countries of the Europe Region offer course programmes of which the enrolment ratio is as follows (based on the latest statistics): France 100; Greece 100; the Netherlands 100; Sweden 100; Switzerland 100; Yugoslavia 100; Finland 63.72; the FRG 47.00; Ireland 27.85; Canada 0.23. No programmes are offered at this level in Austria, Norway, Poland, Portugal, and Turkey. There are no available data for Iceland, Israel, the United Kigdom, the United States of America and the USSR;

— 9 countries offering programmes at level 6 have registered the following percentages: Austria 100; Norway 100; Poland 100; Portugal 100; Canada 93.11; Turkey 91.36; Ireland 72.15; the FRG 52.54; Finland 30.83. There are no programmes offered at this level in France, Greece, the Netherlands, Sweden, Switzerland and Yugoslavia. There are no available data for Iceland, Israel, Romania, the United Kingdom, the Unites States and the USSR;

— only 4 countries are represented at level 7 in this field with the following percentages: Turkey 8.64; Canada 6.66; Finland 5.45; and the FRG

0.96. There are no programmes offered at level 7 in Austria, France, Greece, Ireland, the Netherlands, Norway, Poland, Portugal, Switzerland, and Yugoslavia. There are no available data for Iceland, Israel, the United Kingdom, the United States and the USSR.

12 countries do not offer course programmes in this field at any level: Albania, Belgium, Bulgaria, Cyprus, Czechoslovakia, Denmark, the GDR, Hungary, Italy, Luxemburg, Malta and Spain.

For France, the Service trades are also included in the figures for this field at level 5.

A study of these percentages reveals the following: at level 5, there are decreases in the FRG (from 52.28 to 47.00) and Ireland (40.35; 27.85). At level 6, increases can be observed in the FRG (from 47.45 to 52.54); Ireland (59.65; 72.15) and decreases in Canada (from 93.88 to 93.11) and Finland (95.90; 30.83). At level 7, there are increases in Canada (from 6.12 to 6.66); the FRG (0.27; 0.46) and decreases in Finland (from 4.10 to 5.45).

Service trades

According to ISCED, only course programmes at level 5 are offered in this field. This is the case for 12 countries (Austria, Bulgaria, Canada, Cyprus, Denmark, Finland, the GDR, the FRG, Greece, Hungary, the Netherlands and Norway), which include the entire number of students enrolled in this field into level 5. However, 2 countries also offer course programme at level 6. Thus, Yugoslavia apportions 67.27% of student enrolment to level 5 and 32.73% to level 6 and Turkey 39.93% to level 5 and 60.07% to level 6. No programmes are offered at any level in this field of study in Albania, Belgium, Czechoslovakia, Ireland, Italy, Luxemburg, Malta, Poland, Portugal and Switzerland. There are no data available for France, Iceland, Israel, Romania, Sweden, the United Kingdom, the United States of America and the USSR. Over the period under analysis, there is an increase to be seen at level 5 in Turkey (from 37.96 to 39.93) and a decrease in Yugoslavia (from 73.50 to 67.27). At level 6, one can observe an increase in Yugoslavia (from 26.50 to 32.73) and a decrease in Turkey (from 62.04 to 60.07).

Natural science

The most recent data concerning level 5 of this field of study indicate that course programmes are offered in only 7 countries of the Europe Region, registering the following percentages: Luxemburg 100; Belgium 47.98; Ireland 45.29; Norway 23.91; the United Kingdom 11.26; Yugoslavia 2.09; and Switzerland 0.01 There are no available data for Iceland, Sweden, the United States of America and the USSR. In the majority of the countries of the Region, there are no such programmes offered at level 5;

— level 6 is the most heavily represented: Albania 100; Czechoslovakia 100; Denmark 100; Greece 100; the Netherlands 100; Romania 100; Spain 100; Portugal 98.98; Italy 98.62; Yugoslavia 97.91; Austria 95.66; the FRG 95.15; Turkey 91.58; Bulgaria 91.32; Finland 86.01; Poland 82.22; Canada 80.89; France 79.70; the United Kingdom 73.19; Switzerland 71.05; Belgium 52.02; Israel 49.83; Ireland 45.96; Sweden 40.23; Norway 40.23. There are no such programmes offered in Cyprus, the GDR, Hungary and Malta. There are no data available for Iceland, the United States of America and the USSR;

— at level 7, course programmes are offered in 18 countries, registering the following percentages: the GDR 100; Hungary 100; Sweden 59.77; Norway 59.14; Israel 50.17; Switzerland 28.94; France 20.30; Canada 18.11; Poland 17.78; the United Kingdom 15.55; Finland 13.99; Ireland 8.75; Bulgaria 8.68; Turkey 8.42; the FRG 4.85; Austria 4.34; Italy 1.38; Portugal 1.02. 9 countries do not offer programmes at this level: Albania, Cyprus, Czechoslovakia, Denmark, Luxemburg, Malta, Romania, Spain and Yugoslavia. There are no available data for Belgium, Iceland, the Netherlands, the United States of America and the USSR.

It should be pointed out that data on Mathematics and Computer science have been included in this category by the following countries: Albania, Belgium, Romania, Sweden and Yugoslavia.

These percentages have evolved as follows: at level 5, increases can be observed in Ireland (from 41.02 to 45.29) and Norway (12.82; 32.91), and decreases in Switzerland (from 0.10 to 0.01); the United Kingdom (12.69; 11.26) and Yugoslavia (3.65; 2.09). At level 6, there are increases in Bulgaria (from 85.58 to 91.32); Canada (78.14; 80.89); France (76.72; 79.79); the United Kingdom (72.70; 73.19) and Yugoslavia (96.35; 97.91) and decreases in Austria (from 98.39 to 95.66); Finland, (89.94; 86.01); the FRG (95.99; 95.15); Ireland (49.50; 45.96); Norway (21.74; 16.95); Switzerland (74.00; 71.05) and Turkey (99.36; 91.58). At level 7, there are increases in Austria (from 1.61 to 4.34); Finland (10.06; 13.99); the FRG (4.01; 4.85); Switzerland (25.90; 28.94); the United Kingdom (14.61; 15.55) and decreases in Bulgaria (from 12.42 to 8.68); Canada (21.86; 19.11); France (23.28; 20.30); Ireland (9.48; 8.75) and Norway (65.43; 59.14).

Mathematics and computer science

— At level 5, the following percentages are recorded: Cyprus 100; Norway 98.10; Hungary 68.91; Finland 38.93; Canada 33.97; Spain 33.91; the United Kingdom 28.37; Ireland 28.08; France 23.17; the GDR 13.69; Italy 5.38; Turkey 2.88; Greece 1.56; Switzerland 0.04. There are no course programmes offered at level 5 in this field in Albania, Austria, Bulgaria, Czechoslovakia, Denmark, the FRG, Israel, Malta, the Netherlands, Poland, Portugal, and Romania. No data are available for Belgium, Iceland, Luxemburg, Sweden, the United States of America, the USSR and Yugoslavia;

— at level 6, the percentages are as follows: Czechoslovakia 100; Denmark 100; the Netherlands 100; Poland 99.52; the FRG 99.29; Portugal 99.12; Greece 98.44; Turkey 97.12; Austria 94.20; Bulgaria 93.65; Italy 93.55; Switzerland 90.73; Israel 84.35; France 76.83; Spain 66.09; the United Kingdom 61.99; Canada 60.57; Finland 58.29; Ireland 48.97; the GDR 21.53; Norway 1.90. There are no such programmes offered in Cyprus, Hungary, Luxemburg, and Malta. No data are available for Albania, Belgium, Iceland, Romania, Sweden, the United States of America, the USSR and Yugoslavia;

— at level 7, the following percentages are recorded: the GDR 64.78; Hungary 31.09; Ireland 22.95; Israel 15.65; the United Kingdom 9.64; Switzerland 9.23; Bulgaria 6.35; Austria 5.80; Canada 5.46; Finland 4.78; Italy 1.07; Portugal 0.88; Poland 0.48; the FRG 0.71. No programmes are offered at level 7 in this field in Albania, Cyprus, Czechoslovakia, Denmark, France, Luxemburg, Malta, Norway, Romania and Turkey. There are no available data for Belgium, Greece, Iceland, the Netherlands, Spain, Sweden, the United States of America, the USSR and Yugoslavia.

A study of the evolution of these percentages reveals the following: at level 5, one can observe increases in Canada (from 33.82 to 33.97); Hungary 52.82; 68.91); Italy (3.58; 5.38); Norway (53.62; 98.10); Spain (14.46; 33.91); Turkey (2.09; 2.88) and the United Kingdom (18.55; 28.37) and decreases in Ireland (from 28.43 to 28.08) and Switzerland (4.89; 0.04). At level 6, there are increases in Canada (from 59.43 to 60.57); the FRG (98.87; 99.29); Ireland (43.75; 48.97); Italy (92.55; 93.55); Norway (1.45; 1.90); Switzerland (82.58; 90.73) and decreases in Austria (95.92; 94.20); Finland (93.05; 58.29); the GDR (30.23; 21.53); Spain (85.54; 66.09); Turkey (97.91; 97.12) and the United Kingdom (73.54; 61.99). At level 7, we find increases in Austria (from 4.08 to 5.80) and the United Kingdom (7.88; 9.64) and decreases in Canada (from 6.75 to 5.46); Finland (6.95; 4.78); the GDR (69.77; 64.78); the FRG (1.13; 0.71); Hungary (47.18; 31.09); Ireland (27.82; 22.95); Italy (4.07; 1.07) and Switzerland (12.53; 9.23).

Medical science and health-related sciences

The most recent data for this field at level 5 give us the following percentages: Cyprus 100; Luxemburg 100; the United Kingdom 73.81; Norway 72.34; Finland 62.08; the Netherlands 55.21; Denmark 52.67; Sweden 52.28; the FRG 50.81; Belgium 42.98; Poland 42.96; Canada 42.13; Greece 37.42; Israel 35.40; Portugal 26.73; Hungary 25.12; Spain 20.60; Yugoslavia 12.04; Ireland 6.95; Austria 6.74; Switzerland 1.91; France 0.47; Turkey 0.40. There are no programmes offered at level 5 in this field in Bulgaria, Czechoslovakia, the GDR, Italy, Malta and Romania. There are no available data for Iceland, the United States of America and the USSR;

— at level 6, the following percentages can be observed: Albania 100; Czechoslovakia 100; Malta 100; Romania 100; Bulgaria 99.33; Austria 92.83; Turkey 90.29; Yugoslavia 87.96; Ireland 84.75; Switzerland 84.69; Spain 79.40; the GDR 76.09; France 74.35; Italy 74.12; Portugal 72.56; Greece 62.58; Belgium 57.07; Poland 55.64; the FRG 48.29; Denmark 47.33; the Netherlands 44.79; Canada 42.90; Israel 40.33; Sweden 36.63; Finland 34.85; the United Kingdom 21.67; Norway 0.17. There are no such programmes offered in Hungary and Cyprus. No data are available for Iceland, the United States of America and the USSR;

— at level 7, the following percentages are recorded: Hungary 74.88; Norway 27.49; Italy 25.88; France 25.18; Israel 24.47; the GDR 23.91; Switzerland 13.40; Canada 11.97; Sweden 11.90; Turkey 9.31; Ireland 8.30; the United Kingdom 4.52; Finland 3.07; the FRG 0.09; Portugal 0.71; Bulgaria 0.67; Austria 0.43; and Poland 0.10. No such programmes are offered in Albania, Cyprus, Czechoslovakia, Luxemburg, Malta, Romania and Yugoslavia. There are no data available for Belgium, Denmark, Greece, Iceland, the Netherlands, Spain, the United States of America and the USSR.

The analysis of the evolutions reveals the following points: at level 5 are observed increases in Denmark (from 45.32 to 52.67); Finland (58.31; 62.08); Greece (31.38; 37.42); Hungary (14.85; 25.12); Ireland (5. 90; 6.95); Norway (70.68; 72.34); Portugal (22.87; 26.73); Spain (14.19; 20.60) and decreases in Canada (from 43.55 to 42.13) the FRG (52.29; 50.81); Poland (43.64; 42.26);

Switzerland (3.02; 1.91) and Yugoslavia (12.99; 12.04). At level 6 increases can be seen in Bulgaria (from 79.02 to 99.33); Canada (41.31; 42.90); the FRG (47.11; 48.29); Yugoslavia (87.01; 87.96) and decreases in Austria (from 99.67 to 92.83); Denmark (54.68; 47.33); Finland (40.42; 34.85); France (75.49; 74.35); the GDR (77.85; 76.09); Greece (68.62; 62.58); Iceland (86.75; 84.75); Italy (80.110; 74.12); Portugal (77.13; 72.56); Spain (85.81; 79.40) and Switzerland (88.41; 84.69). At level 7, the percentages increase in Austria (from 0.33 to 0.43); Bulgaria (0.66; 0.67); Finland (1.27; 3.07); France (24.51; 25.18); the GDR (22.15; 23.91); the FRG (0.60; 0.90); Ireland (7.35; 8.30); Italy (19.90; 25.88); Switzerland (8.57; 13.40) and they decrease in Canada (from 15.14 to 11.97); Hungary (85.15; 74.88) and Norway (29.32; 27.49).

Engineering

The most recent data relating to this field of study reveal that at level 5 the following percentages are observed: Cyprus 100; Luxemburg 100; Switzerland 70.90; Sweden 61.00; Ireland 60.67; Greece 57.80; Spain 57.47; Israel 56.66; Norway 54.54; Finland 53.17; the United Kingdom 52.42; Canada 43.11, Yugoslavia 20.83; Turkey 20.80; Hungary 19.01; the FRG 12.08; Denmark 9.07; Austria 6.37; Belgium 2.24. There are no programmes offered at this level in Albania, Bulgaria, France, the GDR, Italy, Malta, the Netherlands, Poland, Portugal, and Romania. No data are available for Iceland, the United States of America, and the USSR;

— at level 6, the following percentages are recorded: Albania 100; Czechoslovakia 100; Malta 100; the Netherlands 100; Romania 100; Portugal 99.76; Italy 99.57; Belgium 97.76; France 97.52; Bulgaria 97.15; Poland 93.29; Denmark 90.93; the FRG 87.61; Austria 87.29; Yugoslavia 79.17; Turkey 74.16; the GDR 50.05; Canada 47.97; Spain 42.53; Greece 42.20; Finland 41.06; the United Kingdom 38.57; Ireland 36.78; Sweden 34.49; Israel 33.50; Switzerland 26.51; Norway 6.60. There are no such programmes offered in Hungary. No data are available for Iceland, the United States of America, and the USSR;

— at level 7, the percentages are: Hungary 80.99; the GDR 49.95; Norway 38.82; Israel 9.84; Canada 8.93; the United Kingdom 8.01; Poland 6.71; Austria 6.34; Finland 5.77; Turkey 5.04; Sweden 4.51; Bulgaria 2.85; Ireland 2.55; Switzerland 2.59; France 2.48; Italy 0.43; the FRG 0.31; Portugal 0.24. There are no programmes offered at level 7 in this field in Albania, Luxemburg, Malta, the Netherlands, Romania and Yugoslavia. No data are available for Belgium, Cyprus, Czechoslovakia, Denmark, Greece, Iceland, Spain, the United States of America, and the USSR.

The data for Engineering also include other technical fields in the cases of Belgium, Israel and Romania.

The percentages show the following evolution: at level 5, increases are seen in Canada (from 41.84 to 43.11); Greece (57.34; 57.80); Ireland (60.30; 60.67); Switzerland (60.26; 70.90); the United Kingdom (45.88; 52.42) and decreases in Denmark (from 12.53 to 9.07); Finland (60.29; 53.17); the FRG (15.06; 12.08); Hungary (21.21; 19.01); Norway (57.76; 54.54); Spain (58.05; 57.47) and Yugoslavia (26.88; 20.83). At level 6, the percentages increase in Denmark (from 87.47 to 90.93); Finland (35.33; 41.06); the FRG (84.59; 87.61); Ireland (35.77; 36.78); Italy (99.28; 99.57); Norway (2.15; 6.64);

Spain (41.95; 42.53); Yugoslavia (73.12; 79.17) and decrease in Austria (from 95.95 to 87.29); Bulgaria (97.25; 97.15); Canada (50.71; 47.97); the GDR 53.33; 50.05); Hungary (42.66; 42.20); Switzerland (33.72; 26.51); Turkey (92.57; 74.16) and the United Kingdom (46.55; 39.57). At level 7, increases can be observed in Austria (from 4.05 to 6.34); Bulgaria (2.75; 2.85); Canada (7.45; 8.93); Finland (4.38; 5.77); the GDR (46.67; 49.95); Hungary (78.79; 80.99); the United Kingdom (7.57; 8.01) and decreases in the FRG (from 0.35 to 0.31); Ireland (3.93; 2.55); Italy (0.72; 0.43); Norway (40.09; 38.82); Portugal (0.26; 0.24) and Switzerland (6.02; 2.59).

Architecture and town planning

— Only 9 countries of the Europe Region have data recorded for level 5 in this field of study; the following percentages are recorded: Belgium 100; Ireland 72.46; Canada 62.37; Hungary 56.07; Spain 39.92; Norway 12.22; France 18.23; the United Kingdom 17.08; Turkey 0.78. No programmes are offered at level 5 in this field in 15 countries: Austria, Bulgaria, Czechoslovakia, Denmark, Finland, the GDR, the FRG, Greece, Italy, Malta, Poland, Portugal, Romania, Switzerland, and Yugoslavia. There are no available data for Iceland, Israel, Sweden, the United States of America and the USSR;

— enrolment on level-6 programmes account for the following percentages: Czechoslovakia 100; Denmark-100; Greece 100; Malta 100; Poland 100; Portugal 100; Yugoslavia 100; the FRG 99.63; Italy 99.33; Switzerland 97.52; Austria 95.73; Finland 94.58; Bulgaria 91.32; Turkey 87.27; France 81.77; the United Kingdom 61.90; Spain 60.08; Canada 32.61; Ireland 25.13. No programmes are offered at this level in the GDR, Hungary and Norway. There are no available data for Belgium, Iceland, Israel, Romania, Sweden, the United States of America and the USSR;

— at level 7, the percentages are as follows: the GDR 100; Norway 80.78; Hungary 43.93; the United Kingdom 21.02; Turkey 11.95; Bulgaria 8.68; Finland 5.42; Canada 5.02; Austria 4.27; Switzerland 2.48; Ireland 2.41; Italy 0.67; the FRG 0.37. There are no programmes offered at level 7 in Czechoslovakia, France, Greece, Malta, Poland, Portugal, Romania, and Yugoslavia. There are no data available for Belgium, Denmark, Iceland, Israel, Spain, Sweden, the United States of America and the USSR.

Albania, Cyprus, Luxemburg and the Netherlands do not offer course programmes at any level for this field of study.

These percentages have evolved as follows: at level 5, increases are to be seen in Canada (from 61.65 to 62.37); Norway (7.08; 19.22); Spain 38.72; 39.92); and decreases in Hungary (from 56.49 to 56.07); Ireland (73.60; 72.46) and the United Kingdom (18.79; 17.08). At level 6, the percentages increase in the FRG (from 99.28 to 99.63); Ireland (24.96; 25.13); the United Kingdom (61.61; 61.90); and decrease in Austria (from 97.00 to 95.73); Canada (33.50; 32.61); Finland (95.66; 94.58); Italy (99.35; 99.33) and Spain (61.28; 60.08). At level 7, they increase in Austria (from 3.00 to 4.27); Canada (4.85; 5.02); Finland (4.40; 5.42); Hungary (43.51; 43.93); Ireland (194; 2.41); Italy (0.65; 0.67) and the United Kingdom (19.70; 21.02) and they decrease in the FRG (from 0.72 to 0.37) and Norway (92.93; 80.78).

Trade, craft and industrial programmes

According to ISCED classifications, this field of study is offered only at level 5. Such course programmes are offered in 14 countries: Belgium, Cyprus, Denmark, France, the GDR, the FRG, Greece, Hungary, the Netherlands, Norway, Poland, Portugal, Switzerland, and Yugoslavia. Ireland allocates 82.82% of enrolments to level 5, 16.49% to level 6, and 0.69% to level 7. Turkey registers 33.76% for level 5 and 66.34% for level 6. In 10 countries (Albania, Austria, Bulgaria, Canada, Czechoslovakia, Finland, Italy, Luxemburg, Malta and Spain) there are no programmes offered in this field at any level. There are no available data for 7 countries: Iceland, Israel, Romania, Sweden, the United Kingdom, the United States of America and the USSR.

Transport and communications

Transport and communications are, according to ISCED, again only offered at level 5. However, the data of only 11 countries (Belgium, Canada, Cyprus, Denmark, Finland, the FRG, Greece, the Netherlands, Norway, Switzerland, and Turkey) would support this. In 2 countries (Czechoslovakia and Romania), the course programmes fall in level 6. In 6 other countries, the programmes are distributed across the levels, with the following percentages: Poland 97.65 at level 6 and 2.35 at level 7; Hungary 76.92 at level 5 and 23.08 at level 7; Bulgaria 75.18 at level 5, 23.39 at level 6 and 1.42 at level 7; France 38.14 at level 5 and 61.86 at level 6; the United Kingdom 45.87 at level 5, 46.81 at level 6, and 7.32 at level 7. Yugoslavia 34.99 at level 5 and 65.01 at level 6. In 9 countries no programmes are offered: Albania, Austria, the FRG, Ireland, Italy, Luxemburg, Malta, Portugal, and Spain. Furthermore, no data are available for 5 countries: Iceland, Israel, Sweden, the United States of America and the USSR.

Agriculture, forestry and fishery

In this field, the most recent data show that the following percentages are to be observed at level 5: Cyprus 100; France 73.05; Canada 60.86; Greece 58.08; the Netherlands 47.03; Finland 32.17; Hungary 29.15; the FRG 26.56; the United Kingdom 23.18; Switzerland 22.75; the GDR 21.37; Belgium 18.44; Denmark 13.86; Sweden 11.70; Poland 8.27; Norway 7.65; Ireland 6.68; Yugoslavia 5.85; Turkey 0.72. There are no programmes offered in this field at level 5 in Albania, Austria, Bulgaria, Czechoslovakia, Israel, Italy, Luxemburg, Malta, Portugal, Romania and Spain. There are no available data for Iceland, the United States of America, and the USSR;

— at level 6 the following percentages are recorded: Albania 100; Czechoslovakia 100; Romania 100; Spain 100; Portugal 98.75; Italy 98.28; Bulgaria 97.67; Austria 94.71; Yugoslavia 94.15; Turkey 90.24; Denmark 86.14; Belgium 81.56; Ireland 81.39; Poland 81.13; the FRG 70.45; Sweden 68.56; Switzerland 65.85; Israel 62.24; Finland 62.11; the United Kingdom 60.04; the Netherlands 52.97; Greece 41.93; the GDR 41.01; Canada 30.76; France 26.95; Norway 9.79. There are no programmes offered at level 6 in Cyprus, Hungary, Luxemburg and Malta. There are no available data for Iceland, the United States of America and the USSR;

— at level 7, the countries register the following percentages: Norway 82.56; Hungary 70.85; Israel 37.76; the GDR 37.62; Sweden 19.74; the United Kingdom 16.78; Ireland 11.93; Switzerland 11.40; Poland 10.60; Turkey 9.04; Canada 8.38; Finland 5.72; Austria 5.29; the FRG 2.99; Bulgaria 2.33; Italy 1.72; Portugal 1.25. Level 7 is not represented in the data submitted by Albania, Cyprus, Czechoslovakia, France, Greece, Luxemburg, Malta, Romania, and Yugoslavia. Moreover, there are no available data for Belgium, Denmark, Iceland, the Netherlands, Spain, the United States of America and the USSR.

An analysis of the evolution of these percentages reveals the following: at level 5, they increase in Denmark (from 9.61 to 13.86); Finland (21.60; 32.17); Greece (40.69; 58.07); Norway (4.83; 7.65); Switzerland (10.44; 22.75) and the United Kingdom (21.65; 23.18) and decrease in Canada (from 62.00 to 60.86); the FRG (30.07; 26.56); Hungary (32.23; 29.15); Poland (17.74; 8.27); Turkey (6.62; 0.72) and Yugoslavia (10.65; 5.85). At level 6, they increase in the FRG (from 68.20 to 70.45); Ireland (62.20; 81.39); Norway (8.02; 9.79) and Yugoslavia (89.35; 94.15) and decrease in Austria (from 99.49 to 94.71); Canada (31.61; 30.76); Denmark (90.39; 86.14); Finland (73.43; 62.11); the GDR (55.69; 41.01); Greece (59.31; 41.93); Italy (98.73; 98.28); Switzerland (80.59; 65.85); Turkey (93.40; 90.24) and the United Kingdom (60.93); 60.04). At level 7, they increase in Austria (from 0.51 to 5.29); Canada (6.39; 8.38); Finland (4.96; 5.72); the FRG (1.73; 2.99); Hungary 67.77; 70.85); Ireland (8.01; 11.93.); Italy (1.27; 1.72); Switzerland (8.97; 11.40) and decrease in the GDR (from 44.31 to 37.62); Norway (87.15; 82.56) and the United Kingdom (17.42; 16.78).

Other and not specified

— At level 5, the following percentages are recorded: Cyprus 100; the GDR 100; Italy 96.89; Yugoslavia 94.80; Ireland 80.94; Belgium 61.50; Norway 60.83; Israel 59.66; Denmark 48.67; Finland 42.61; the Netherlands 25.52; the FRG 17.35; France 14.37; Spain 6.75; Canada 1.38; the United Kingdom 0.03. In this field no course programmes at level 5 are offered in Albania, Austria, Bulgaria, Greece, Hungary, Malta, Poland, Portugal, Romania, Switzerland and Turkey. There are no available data for Iceland, Luxemburg, Sweden, the United States of America and the USSR;

— at level 6, the percentages recorded are as follows: Albania 100; Czechoslovakia 100; Hungary 100; the United Kingdom 99.70; Poland 96.94; Canada 96.86; Portugal 95.75; Spain 93.25; Austria 91.10; France 83.34; the FRG 81.94; the Netherlands 75.48; Finland 51.99; Denmark 51.33; Belgium 38.50; Norway 25.80; Israel 19.45; Ireland 17.04; Yugoslavia 5.20 and Italy 2.07. There are no such programmes offered in Bulgaria, the GDR, Greece, Luxemburg, Malta, Romania, Switzerland and Turkey;

— the registrations at level 7 are insignificant if recorded at all.

2.4 Proportion of female students in each country's total number of students

At world, continental and geographically determined regional levels, the percentage of female students in the total number of students evolved in the following way:

a) *in 1980* — 42.2% at world level, 25.8% in Africa; 49.9% in North America; 43.8% in South America; 30.7% in Asia; 44.7% in Europe; 44.0% in Oceania; 50.0% in the USSR and 48.8% in the Europe Region;

b) *in 1985* — 42.9% at world level; 28.1% in Africa; 50.6% in North America; 45.5% in South America; 32.9% in Asia; 46.5% in Europe; 46.8% in Oceania; 50.0% in the USSR and 49.9% in the Europe Region.

From the total of 19.8 million females studying throughout the world in 1980, there were 0.4 million (2.0%) in Africa; in North America 7.2 million (36.4%); in South America 1.5 million (7.6%); in Asia 4.1 million (20.7%); in Europe 3.8 million (19.2%); in Oceania 0.2 million (1.0%); in the USSR 2.6 million (13.1%); and in the Europe Region 13.2 million (66.7%).

From the total of 23.3 million female students throughout the world in 1985, there were 0.5 million (21%) in Africa; in North America 7.8 million (33.5%); in South America 2.0 million (8.6%); in Asia 5.8 million (24.9%); in Europe 4.4 million (18.9%); in Oceania 0.2 million (0.9%); in the U.R.S.S. 2.6 million (11.1%) and in the Europe Region 14.2 million (60.9%).

Between 1980—1985 the growth index in the number of female student registrations was 118% at world level, differing slightly in respect to the given areas: Africa 125%; North America 108%; South America 133%; Asia 141%; Europe 116%; Oceania and the USSR 100%; the Europe Region 108%.

As seen in Table 2.3. the highest percentages are registered in the GDR, Poland and Bulgaria (56 to 58%), and the lowest ones in Turkey and Malta (24 to 25%). The countries may be grouped into the following categories (of %):

— percentages of *50% and above* can be observed in the base year (1980 in the majority of cases), in 9 countries: the GDR 58%; Bulgaria and Poland 56%; Israel and the United States of America 51%; Albania, Canada, Hungary, and the USSR 50%. In the last year (1985 in the majority of cases), the following percentages are registered in 10 countries: Poland 56%; Bulgaria 55%; the GDR and Hungary 54%; Iceland and Portugal 53%; the United States of America 52%; the USSR, France and Norway 50%;

— percentages *between 40 and 49* can be observed in the base year, in 19 countries: Denmark 49%; Finland, Norway and Portugal 48%; France 46%; Sweden and Yugoslavia 45%; Belgium and Spain 44%; Italy and Romania 43%; Austria, Cyprus and Czechoslovakia 42%; the FRG, Greece and Ireland 41%; Iceland and the Netherlands 40%. In the last year, 18 countries registered the following percentages: Denmark and Finland 49%; Cyprus and Spain 48%; Greece and Sweden 47%; Belgium, Canada and Israel 46%; Albania, Austria, Romania and Yugoslavia 45%; Czechoslovakia, Ireland, and Italy 43%; the FRG 42% and the Netherlands 41%;

— percentages *between 30 and 39* can be seen in the base year, in 3 countries: the United Kingdom 37%; Luxemburg 35% and Switzerland 30% and in the last year in 5 countries: the United Kingdom 36%, Luxemburg 34%, Malta 33%, Switzerland 32% and Turkey 31%;

— percentages *below 30* can be observed in the base year only in Turkey (25%) and Malta (24%).

A study of the *evolution* of these percentages reveals the following:

Table 2.3.

Percentage of female students in the total number of students in the countries of the Europe Region

Country	Base year		Last year	
	Year	Percentage %	Year	Percentage %
Albania	1980	50	1985	45
Austria	1980	42	1985	45
Belgium	1980	44	1985	46
Bulgaria	1980	56	1985	55
Canada	1980	50	1985	46
Cyprus	1980	42	1985	48
Czechoslovakia	1980	42	1985	43
Denmark	1980	49	1984	49
Finland	1980	48	1985	49
France	1980	46	1984	50
German Dem. Rep.	1980	58	1985	54
Germany, Fed. Rep. of	1980	41	1985	42
Greece	1980	41	1983	47
Hungary	1980	50	1985	54
Iceland	1980	40	1985	53
Ireland	1980	41	1984	43
Israel	1980	51	1984	46
Italy	1980	43	1984	43
Luxemburg	1980	35	1984	34
Malta	1980	24	1985	33
Netherlands	1980	40	1984	41
Norway	1980	48	1984	50
Poland	1980	56	1985	56
Portugal	1980	48	1984	53
Romania	1980	43	1985	45
Spain	1980	44	1984	48
Sweden	1979	45	1984	47
Switzerland	1980	30	1985	32
Turkey	1980	25	1984	31
United Kingdom	1980	37	1984	36
United States	1980	51	1985	52
USSR	1978	50	1985	50
Yugoslavia	1980	45	1984	45

Source: *Unesco Statistical Yearbook* 1986; 1987;
Higher Education and Economic Development in Europe 1975—1980, Vol. I — Unesco CEPES, 1983.

Note: Data for Albania, Bulgaria, the German Dem. Rep., Hungary, Poland, Romania — include part-time and correspondence education; the Netherlands and the United Kingdom — include Open University; Spain — include Universidad de educación a distancia; Israel — except 1984, data also include Open University; Belgium — 1980 data relate only to full-time students; the German Dem. Rep. — data also include preparatory studies for higher education, extended secondary schools and technical education.

— in 4 countries, the *same percentages can be observed in both the base year and the last year:* Denmark 49%; Poland 46%; Yugoslavia 45% and Italy 43%;

— in 6 countries, the *percentages increase by 5 points or more:* Iceland (from 40 to 53%); Malta (24; 33); Cyprus (42;48); Greece (41; 47); Turkey (25; 31) and Portugal (48; 53);

— in 15 countries, *the percentages increase by less than 5 points:* France (46; 50); Hungary (50; 54); Spain (44; 48); Austria (42; 45); Belgium (44; 46); Ireland (41; 43); Norway (48; 50); Romania (43; 45); Sweden (45; 47); Switzerland (30; 32); Czechoslovakia (42; 43;); Finland (48; 49); the FRG (41; 42); the Netherlands (40; 41); the United States of America (51; 52);

— in 2 countries, the *percentages decrease by 5 points:* Albania (50; 45) and Israel (51; 46);

— in 5 countries, the *percentages decrease by less than 5 points:* the GDR (51; 46); Canada (50; 47); Bulgaria (56; 55); Luxemburg (35; 34) and the United Kingdom (27; 36).

2.5 Proportion of female students in the total number of students at each level of higher education

From the analysis of Table 2.4., the percentages of female students in the total number of students at each level of higher education in the countries of the Europe Region are observed as follows:

— in 2 countries, where the higher education is only offered at level 5, the percentage of female students only relates to this level: Cyprus (42% in 1980 and 48% in 1985) and Luxemburg (35; 34);

— in 10 countries the highest level of female student participation is to be found at level 5: Austria (75.38% in the base year and 69.99% in the last year); Belgium (. . .; 54.96); Bulgaria (74.55; 74.30); Denmark (74.74; 71.80); the FRG (65.17; 65.90); Italy (55.01; 55.55); the Netherlands (. . .; 45.81); Poland (75.11; 71.67); Portugal (86.13; 85.98); Spain (47.79; 49.18);

— in 3 countries, where higher education is offered only at level 6, the percentages of female students are: Albania 50 and 45%; Czechoslovakia 42 and 43%; Romania 44 and 45%;

— level 6 attracts the highest level of female student participation in 8 countries: Canada (51.54; 54.09); Finland (50.56); 51.56); the GDR (71.69; 71.51); France (. . .; 50.58); Hungary (70.04; 69.54); Iceland (46.28; 44.26); Israel (. . .; 48.26); Switzerland (33.53; 36.54) and Yugoslavia (45.92; 45.64).

As a consequence of certain changes in the distribution of students over the 3 levels of higher education, in some countries changes have also taken place in the proportion of female students. Thus, in Greece the percentage of female students increases substantially at level 5 (from 39.18% in 1980 to 448.97% in 1983); in the case of Malta, no figures were recorded for women at level 7 in the base year, although 28.75% can be observed in the last year; in Norway, the highest proportion of female students is to be found at level 5 in the base year, and in the last year at level 6; in Turkey, there is no entry for level 7 in the base year, while in the last year the percentage of female students is observed as 32.56%; in the United Kingdom there is a shift in the percentage of female students towards level 5 (from 28.97% in the base year to 48.08% in the last year).

Table 2.4.

Proportion of female students in the total number of students at each level of higher education in the countries of the Europe Region

(%)

Country	Base year				Last year			
	Year	Levels			Year	Levels		
		5	6	7		5	6	7
Albania	1980	—	50.00	—	1985	—	45.00	—
Austria	1980	75.38	39.75	18.90	1985	69.99	42.94	27.82
Belgium	. . .	. . .	. . .	. . .	1985	54.96	38.09	./.
Bulgaria	1980	74.55	53.16	56.26	1985	74.30	53.02	41.21
Canada	1980	50.91	51.54	37.23	1985	51.76	54.09	42.32
Cyprus	1980	42.00	—	—	1985	48.00	—	—
Czechoslovakia	1980	—	42.00	—	1985	—	43.00	—
Denmark	1980	75.74	41.28	./.	1984	71.80	41.78	./.
Finland	1980	45.30	50.56	35.94	1985	44.31	51.56	39.22
France	. . .	. . .	. . .	. . .	1982	50.32	50.58	39.24
German Dem. Rep.	1980	47.78	71.69	47.47	1985	39.57	71.51	47.16
Germany, Fed. Rep. of	1980	65.17	36.83	28.73	1985	65.90	37.89	35.17
Greece	1980	39.18	42.39	. . .	1983	48.97	46.47	. . .
Hungary	1980	52.82	70.04	40.74	1985	58.47	69.54	42.83
Ireland	1980	31.67	46.28	44.24	1982	37.10	44.26	43.69
Israel	. . .	. . .	. . .	. . .	1984	43.32	48.26	46.83
Italy	1980	55.01	42.95	30.47	1984	55.55	45.74	32.36
Luxemburg	1980	35.00	—	—	1984	34.00	—	—
Malta	1980	4.76	25.30	—	1985	—	32.52	28.57
Netherlands	. . .	. . .	. . .	. . .	1984	45.81	35.69	./.
Norway	1981	55.73	54.97	32.52	1984	52.28	58.16	38.53
Poland	1980	75.11	35.22	52.89	1985	71.67	51.27	41.13
Portugal	1980	86.13	44.00	38.16	1984	85.98	49.70	36.94
Romania	1980	—	44.00	—	1985	—	45.00	—
Spain	1980	47.79	42.48	./.	1984	49.18	48.21	./.
Switzerland	1980	26.01	33.53	22.34	1985	24.64	36.54	27.85
Turkey	1980	23.80	26.20	—	1984	30.38	31.57	32.56
United Kingdom*	1980	28.97	41.15	30.85	1983	48.08	44.21	32.89
Yugoslavia	1980	43.75	45.92	. . .	1984	43.90	45.64	. . .

Source: Computed from the *Unesco Statistical Yearbook* 1983, 1985, 1986, 1987.
Note: There are no available data for Iceland, Sweden, the United States of America and the USSR.

2.6 Distribution of female students by levels of higher education

An analysis of the distribution of foreign female students by levels of higher education, which is reflected in the proportions of female students registered at each level within the total number of female students in the countries of the Europe Region — as seen in Table 2.5. — leads, in the first place, to the emergence of certain characteristics of groups of countries:

Table 2.5.

Proportion of female students at each level of higher education in the total number of female students in the countries of the Europe Region

Country	Base year, %				Last year, %			
	Year	Levels			Year	Levels		
		5	6	7		5	6	7
Albania	1980	—	100.00	—	1985	—	100.00	—
Austria	1980	13.18	86.09	0.73	1985	11.28	86.72	2.00
Belgium	...	...	...	...	1985	54.30	45.70	./.
Bulgaria	1980	18.36	79.66	1.98	1985	11.42	86.75	1.83
Canada	1980	30.28	63.30	6.42	1985	19.02	74.85	6.13
Cyprus	1980	100.00	—	—	1985	100.00	—	—
Czechoslovakia	1980	—	100.00	—	1985	—	100.00	—
Denmark	1980	34.16	65.84	./.	1984	36.81	63.19	./.
Finland	1980	30.70	66.00	3.30	1985	25.77	69.74	4.49
France	...	...	...	...	1982	16.53	73.60	9.87
German Dem. Rep.	1980	18.66	53.24	28.10	1985	19.68	50.58	29.74
Germany, Fed. Rep. of	1980	24.81	74.23	0.96	1985	21.79	76.97	1.24
Greece	1980	7.71	92.29	...	1983	33.65	66.35	...
Hungary	1980	43.49	19.44	31.07	1985	45.41	20.44	34.15
Ireland	1980	29.10	60.90	10.00	1982	37.67	53.78	8.55
Israel	...	...	...	...	1984	37.47	45.63	16.90
Italy	1980	3.63	92.36	4.01	1984	3.24	92.66	4.10
Luxemburg	1980	100.00	—	—	1984	100.00	—	—
Malta	1980	0.87	99.13	—	1985	—	99.58	0.42
Netherlands	...	...	...	...	1984	62.41	37.59	./.
Norway	1981	53.25	28.54	20.01	1984	48.12	30.57	21.31
Poland	1980	30.98	8.07	60.95	1985	28.32	67.06	4.62
Portugal	1980	15.05	84.48	0.47	1984	15.14	84.18	0.68
Romania	1980	—	100.00	—	1985	—	100.00	—
Spain	1980	29.15	70.85	./.	1984	24.32	75.68	./.
Switzerland	1980	24.90	67.97	7.13	1985	27.08	64.15	10.11
Turkey	1980	6.71	93.29	—	1984	10.56	84.73	4.71
United Kingdom	1980	22.92	66.80	10.28	1983	39.40	52.81	7.79
Yugoslavia	1980	0.24	99.76	...	1984	19.12	80.88	...

Source: Computed from the *Unesco Statistical Yearbook* 1983, 1985, 1986, 1987.
Notes: ./. — The data of level 7 are included in those of level 6; there are no available data for Iceland, Sweden, the United States of America and the USSR.

— in Cyprus and Luxemburg, all the female students are registered at level 5 (since the higher educational system of these countries is only operated at level 5);

— in Albania, Czechoslovakia and Romania, all female students are registered at level 6 (at which all students in these countries are registered).

Among the countries where higher education is offered at 3 levels, level 5 is predominant in 3 countries: Hungary (43.49% in 1980 and 45.41% in 1985); the Netherlands (...; 62.41) and Norway (53.25; 48.12).

Level 6 predominates in 19 countries: Austria (86.09% in the base year and 86.72% in the last year); Bulgaria (79.66; 86.75); Canada (63.30; 74.85);

Denmark (65.84; 63.19); Finland (66.00; 69.74); France (. . .; 73.60); the GDR (53.24; 50.58); the FRG (74.23; 76.97); Greece (92.29; 66.35); Ireland (60.90; 53.78); Israel (. . .; 45.63); Italy (92.36; 92.66); Malta (99.13; 99.58); Portugal (84.48; 84.18); Spain (70.85; 75.68); Switzerland (67.97; 64.15); Turkey (92.29; 84.73); the United Kingdom (66.80; 52.81) and Yugoslavia (99.76; 80.88). Therefore, level 6 preponderates over other levels in most countries (bearing in mind the total number of students, of both sexes, registered at level 6 in these countries).

High percentages of female students are registered at level 7 (without, however, being preponderant) in only 4 countries: the GDR (28.19; 28.74); Hungary (31.07; 34.15); Israel (. . .; 16.90) and Norway (20.01; 21.31).

In Poland, as a consequence of the changes in the distribution of both male and female students over the three levels, the percentages of female students at level 6 increases from 8.03% in the base year to 67.06% in the last year, and at level 7 from 60.95% to 4.62%.

2.7 Distribution of female students by groups of fields or programmes of study

To have a demonstrative picture of the distribution of female students by fields of study and to facilitate comparisons between given years and countries, bearing in mind that the available statistical data are often cumulated, we are using 5 groups of fields or programmes of study (as in Table 2.6.), following the same criteria as in 2.2. The following observations may be made:

In all the countries for which there are available data, most female students are concentrated in Group I, under the heading *Sciences of man and society*. 70% of the total number of female students are registered in this group in certain countries (as in Austria, Hungary, Luxemburg, the Netherlands and Switzerland). This is partly accounted for by the larger share held by this group of fields in the total number of students (both male and female), furthermore by the priority attached by female students to the specific concerns of these fields. For example, it is conclusive to note that in Austria, 62.52% of the total student numbers (MF) are enrolled in this group of fields, while, according to the latest available data, 72.35% of female students are enrolled in this group. In Hungary, the percentages are 59.39% and 76.23%, respectively; in Luxemburg, 54.45% and 77.51%; in the Netherlands, 62.54% and 72.64% and in Switzerland 58.09% and 75.44%.

Based on the latest available data, one can distinguish several levels of distribution within Group I. Thus, percentages *over 70%* are registered in 6 countries: Luxemburg 77.51%, Switzerland 74.44%, Hungary 76.23%, the Netherlands 72.64%, Israel 72.50% and Austria 72.35%; percentages *between 60 and 70%* are registered in 15 countries: Spain 62.29%, Portugal 68.78%, Cyprus 68.74%, France 68.30%, Greece 67.16%, Malta 66.18%, Belgium 65.24%, Iceland 65.24%, Turkey 65.07%, Ireland 64.31%, Italy 63.33%, Denmark 62.94%, Poland 62.44%, Norway 61.57,% and the FRG 60.95%; percentages *between 50 and 60%* are registered in 6 countries: Finland 59.92%, Sweden 59.77%, Yugoslavia 59.11%, Bulgaria 51.93% and the United Kingdom 51.81%; percentages *below 50%* are registered in 3 countries: Albania 48.40%, Canada 44.31% and the GDR 42.84%.

Table 2.6.

The evolution of female students' distribution by groups of fields or programmes of study

Country	Years		Group of fields (or programmes)									
			I		II		III		IV		V	
Albania	1980;	1985	44.22;	48.48	4.82;	6.46	6.33;	5.24	42.76;	38.65	1.87;	1.17
Austria	1980;	1985	72.09;	72.35	7.33;	6.37	14.69;	14.45	3.84;	5.05	2.05;	1.80
Belgium	. . . ;	1985	. . . ;	65.24	. . . ;	6.51	. . . ;	22.67	. . . ;	4.99	. . . ;	0.59
Bulgaria	1980;	1985	49.68;	51.93	7.22;	7.13	18.00;	9.28	25.10;	31.66	— ;	—
Canada	1980;	1985	58.00;	44.31	3.90;	4.70	10.15;	9.30	3.01;	2.67	24.94;	39.02
Cyprus	. . . ;	1985	. . . ;	68.74	. . . ;	5.84	. . . ;	10.29	. . . ;	7.83	. . . ;	7.30
Czechoslovakia	1980;	1985	55.30;	55.84	3.25;	2.94	11.06;	10.13	30.21;	30.83	0.18;	0.26
Denmark	1980;	1984	66.75;	62.94	2.98;	3.57	23.80;	25.59	4.35;	5.73	2.12;	2.17
Finland	1980;	1985	63.62;	59.92	9.62;	9.80	17.45;	21.30	7.49;	8.64	1.82;	0.34
France	. . . ;	1982	. . . ;	68.30	. . . ;	9.77	. . . ;	15.21	. . . ;	3.57	. . . ;	3.15
German Dem. Rep.	1980;	1985	42.03;	42.84	1.67;	2.20	23.41;	22.65	14.24;	19.88	18.65;	12.34
Germany, Fed. Rep. of	1980;	1985	60.82;	60.95	8.33;	7.82	23.02;	22.18	5.60;	7.30	2.23;	1.75
Greece	1980;	1983	66.31;	67.16	8.98;	7.13	13.15;	14.59	11.51;	11.12	0.10;	—
Hungary	1980;	1985	73.82;	76.23	1.83;	1.41	11.19;	12.15	12.89;	9.96	0.27;	0.25
Iceland	. . . ;	1983	. . . ;	65.24	. . . ;	5.33	. . . ;	27.31	. . . ;	2.12	. . . ;	—
Ireland	1980;	1982	67.05;	64.31	14.79;	17.48	7.44;	6.72	5.07;	6.10	5.65;	5.39
Israel	. . . ;	1984	. . . ;	72.50	. . . ;	8.75	. . . ;	8.65	. . . ;	7.98	. . . ;	2.12
Italy	1980;	1984	62.69;	63.33	12.00;	11.17	19.04;	16.66	6.26;	7.12	0.01;	1.72
Luxemburg	1980;	1984	71.23;	77.51	4.16;	9.69	14.01;	10.03	1.89;	2.77	8.71;	—
Malta	1980;	1985	70.56;	66.18	0.87;	—	25.97;	30.29	2.60;	3.53	— ;	—
Netherlands	1980;	1984	75.33;	72.64	1.77;	1.81	12.40;	14.26	5.25;	6.14	5.25;	5.15
Norway	1981;	1984	61.11;	61.57	4.06;	4.97	19.53;	17.49	5.94;	7.56	9.36;	8.41
Poland	1980;	1985	57.00;	62.44	4.00;	5.31	14.52;	17.97	22.80;	12.50	1.68;	1.78
Portugal	1980;	1984	68.98;	68.78	0.12;	5.30	18.41;	11.46	9.26;	11.53	3.23;	2.93
Spain	1980;	1984	66.45;	69.29	8.48;	8.64	18.79;	13.56	3.69;	4.42	2.59;	4.09
Sweden	1978;	1984	30.44;	59.77	1.06;	5.39	15.03;	18.13	6.45;	11.43	47.02;	5.28
Switzerland	1980;	1985	70.80;	75.44	7.14;	7.22	13.45;	11.73	4.75;	5.61	3.86;	—
Turkey	1980;	1984	58.13;	65.07	9.58;	7.40	14.71;	11.60	16.96;	15.93	0.62;	—
United Kingdom	1980;	1983	72.81;	51.81	13.63;	8.96	8.43;	27.87	4.34;	3.50	0.79;	7.86
Yugoslavia	1980;	1984	70.32;	59.11	4.30;	5.66	10.34;	11.93	13.80;	22.79	1.24;	0.51

Note: There are no available data for Romania, the United States of America and the USSR

Group II, comprising *Natural science, mathematics and computer science*, is characterized by percentages of a most 17.5%, which, according to the latest available data, fall into three categories: percentages *over 10%*, in 2 countries: Ireland 17.84% and Italy 11.17%; *between 5 and 10%*, in 20 countries: Finland 9.80%, France 9.77%, Luxemburg 9.69%, the United Kingdom 8.96%, Israel 8.75, Spain 8.64, the FRG 7.82, Turkey 7.40, Switzerland 7.22%, Bulgaria 7.13%, Greece 7.13%, Belgium 6.51%, Albania 6.46%, Austria 6.37%, Cyprus 5.84% Yugoslavia 5.66%, Sweden 5.39%, Iceland 5.33%, Poland 5.31%, Portugal 5.30% *below 5%*, in 7 countries: Norway 4.97%, Canada 4.70%, Denmark 3.57%, Czeschoslovakia 2.94%, the GDR 2.29%, the Netherlands 1.81% and Hungary 1.41%.

Group III, covering *Medical science and health-related science*, is characterized by percentages of up to 30%, and countries can be distributed into three categories: with percentages *over 20%* — 8 countries: Malta 30.29%, the United Kingdom 28.87%, Iceland 27.31%, Denmark 25.59%, Belgium 22.67%, the GDR 22.65%, the FRG 22.18%, Finland 21.30%, *between 10 and 20%*, 17 countries: Sweden 18.13%, Poland 17.97%, Norway 17.49%, Italy 16.66%, France 15.21%, Greece 14.59%, Austria 14.45%, the Netherlands 14.26; Spain 13.56%, Hungary 12.15%, Yugoslavia 11.93%, Switzerland 11.73%, Turkey 11.60, Portugal 11.46%, Cyprus 10.29, Czeschoslovakia 10.13%, and Luxemburg 10.03%; *below 10%* — 5 countries: Canada 9.30%, Bulgaria 9.28%, Israel 8.65%, Ireland 6.72% and Albania 5.24%.

Group IV, comprising *Predominantly technical fields*, emerges as the general second choice of both male and female students in most countries, thus accounting for about 40% of the total number of female students. The situation is, however, diverse, Thus, in 3 countries percentages are registered of *over 30%*: Albania 38.65%, Bulgaria 31.66% and Czechoslovakia 30.83%; in 3 countries they are *between 15 and 30%*: Yugoslavia 22.79%, the GDR 19.88%, and Turkey 15.93%; in 4 countries they are *between 10 and 15%*. Poland 12.50%, Portugal 11.53%, Sweden 11.43%, Greece 11.12%; in 12 countries they are *between 5 and 10%*: Hungary 9.96%, Finland 8.64%, Israel 7.98%, Cyprus 7.83%, Norway 7.56%, the FRG 7.30%, Italy 7.12%, the Netherlands 6.14%, Ireland 6.10%, Denmark 5.73, Switzerland 5.61%, Austria 5.05%,; in 8 countries they are *below 5%*: Belgium 4.99%, Spain 4.42%, France 3.57%, Malta 3.53%, United Kingdom 3.50%, Luxemburg 2.77%, Canada 2.67%, and Iceland 2.12%.

Group V *Other and not specified*, mostly accounts for only small numbers of enrolments, including female students. There are, however, some exceptions: Canada (24.94% in the base year and 39.02% in the last year), Sweden (47.02% and 5.28%), and the GDR (18.65% and 12.34%); however, these high numbers of female students who cannot be allocated to well-defined fields are a passing phenomenon as they will in the future be classified in accordance with ISCED.

2.8 Part-time students

In various countries of the world, there has been a notable diversification in the forms of part-time education available to those persons employed in economic, social and cultural fields, who wish to improve their social standing by enriching their own knowledge, by deepening their previously acquired specialist skills or by changing their occupation to meet present and future demands brought about by the progress in science and technology, or by a change in their own physical capabilities (as a result of a disease or the ageing process). In some countries, part-time higher education is structured so as to lead to the award of diplomas equivalent to those received by the ordinary student (on full-time or intramural courses). In other countries, specialised diplomas may lead to a particular form of employment. Generally speaking, the statistics on part-time education (also called "(by) correspondence", "distance", "extramural", or "extramuros", "open university") are as yet very scarce. Steps have already been taken to remedy the situation and the Unesco countries were requested to complete a relevant questionnaire, the results of which were collected and further contributed to by the Unesco Statistical Office, in January 1988. These data are presented and analysed in the following pages. Although incomplete, they are a useful beginning, with much promise for future development.

Significant data relating to 21 countries in the Europe Region, are presented in Table 2.7. with an indication of the proportion of this category of students in the total number of enrolled students. Based on the latest data, that of 1985, one can observe that the greatest proportion of part-time students is evident in Switzerland at 59.9%. Proportions *over 40%* are recorded in the USSR (43.7%), the United States of America (42.2%) and the United Kingdom (42.0%); *between 30 and 40%* in Romania (37.4%), Hungary (35.4%), Canada (35.1%), the Netherlands (34.2%) and the GDR (30.0); *below 30%* in Poland (26.8%), Yugoslavia (26.7%), Ireland (22.6%), Bulgaria (22.2%), Turkey 21.1%), Norway (18.0%), Czechoslovakia (16.3%), Cyprus (5.0%) and the FRG (1.3%).

From a comparative analysis of the proportions in the two given years (1980 and 1985), it emerges that they increase in Bulgaria (from 21.4% to 22.2%), Canada 27.0; (35.1), Cyprus (3.8; 5.0), the GDR (24.0; 30.0), the FRG (0.9; 1.3), Hungary (32.5; 35.4), the Netherlands (23.1; 34.2), Norway (14.2; 18.0), Romania (16.2; 37.4), Switzerland (very substantial increase, from 8.6% to 59.9%), Turkey (substantial increase, from 4.0% to 21/1%), the United Kingdom (35.4; 42.0), and the United States of America (41.3; 42.2). However, one can observe *decreases* in Czechoslovakia (from 22.9% to 16.3%), Ireland (23.4; 22.6), Luxemburg (8.0; 7.1), Poland (34.1; 26.8), the USSR (45.9; 43.7) and Yugoslavia (36.1; 26.7).

For 8 countries — Canada, the FRG, Ireland, the Netherlands, Norway, Switzerland, the United Kingdom and Yugoslavia — data are also available on the enrolled students as to their distribution by levels, fields of study and sex. Table 2.8. presents the number of part-time students in the last years for which distributions can be made according to the above-mentioned categories. It is of note that problems are encountered in compiling statistics on education which arise from the impossibility of designing structures in accordance with ISCED requirements. Therefore, for some countries it is not possible to establish the distribution of students by levels (such as the Netherlands for which level 6 also includes the data for level 7). More frequent are the cases in which one cannot make a satisfactory distribution of the total number of part-time students by fields of study. Thus, in the case of Canada, 109,690 part-time students in 1984 and 114,965 in 1985 (see Table 2.8.), which accounts for 25% of the total have not been considered, since they cannot be distributed by fields of study level or sex. In Table 2.9. one can observe that

Table 2.7.

Part-time students in the same country of the Europe Region

(Percentage of total students enrolled)

Country	1980	1985
Belgium	9.2 (1)	. . .
Bulgaria	21.4	22.2
Canada	27.0 (2)	35.1
Cyprus	3.8	5.0
Czechoslovakia	22.9	16.3
German Dem. Rep.	24.0	30.0
Germany, Fed. Rep. of	0.9	1.3
Hungary	32.5	35.4
Ireland	23.4	22.6
Luxemburg	8.0	7.1
Malta	21.2	. . .
Netherlands	23.1	34.2
Norway	14.2	18.0
Poland	34.1	26.8
Romania	16.2	37.4
Switzerland	8.6	59.9
Turkey	4.0	21.1
United Kingdom	35.4	42.0
United States	41.3	42.2
USSR	45.9 (3)	43.7
Yugoslavia	36.1	26.7

Sources: *Higher Education and Economic Development in Europe*, Vol. I, CEPES, Bucharest, 1983, p. 116; Unesco Office of Statistics (December 1987, January 1988).

Notes: (1) 1978; (2) 1979; (3) 1975.

the last category, i.e. *Other and not specified* accounts for a large proportion of the total in some countries, such as Canada 50.31%, Ireland 70.28%, the United Kingdom 18.53%, Norway 14.65%.

With specific reference to *levels* it can be seen that in the FRG and Switzerland the entire part-time higher education of structure is only operative at level 5, and in Yugoslavia only at level 5 and level 6 (where level 5 accounts for 31.07% of the total, and level 6 for 68.93). In 3 countries, the latest data are available for all three levels: Canada, level 5 accounts for 0.79% of the total, level 6/88.74%, and level 7/10.47%; in Norway, level 5 accounts for 48.94%, level 6/28.06%, and level 7/23.00%; in the United Kingdom, level 5 registers 63.06%, level 6/25.65%, and level 7/11.29%; in the Netherlands, level 5 registers 87.70% of the total and levels 6 and 7 together account for the remaining 12.30%; in Ireland there are no available data on the distribution of part-time students by levels.

With reference to *fields of study* (see Table 2.9.) important differences emerge from countriy to country: in *Canada* (except for the data on the category of Other and not specified), the predominant fields of study are Education science and teacher training (about 10.11%) and Commercial and business

Table 2.8.

Part-time student enrolment by ISCED levels

Country	Year	International Standard Classification of Education by Levels			
		All levels	Level 5	Level 6	Level 7
Canada (1)	1984	324 209	3 181	286 891	34 137
	1985	337 207	2 667	299 244	35 299
Germany, Fed. Rep. of	1983	14 060	14 060	—	—
	1984	16 015	16 015	—	—
	1985	20 199	20 199	—	—
Ireland	1983	14 747	. . .	. . .	. . .
	1984	15 214	. . .	. . .	. . .
Netherlands (2)	1983	84 868	77 991	6 877	./.
	1984	77 451	69 139	8 312	./.
	1985	82 783	72 599	10 184	./.
Norway	1984	19 097	11 380	4 295	3 422
	1985	15 867	7 765	4 452	3 650
Switzerland	1984	15 203	15 203	—	—
	1985	16 570	16 570	—	—
United Kingdom (3)	1984	417 460	263 264	107 058	47 138
Yugoslavia	1984	96 188	29 889	66 299	—

Notes: (1) The data do not include 109,690 part-time students in 1984 and 114,965 in 1985, for whom data concerning fields of study were not available.
(2) Levels 6 and 7 are combined.
(3) Including the Open University.

administration (about 14.68%); in the *FRG* these are Engineering (61.29%) and Education science and teacher training (15.98%); in *Ireland* the majority enrol in the Humanities, religion and theology (12.30%), whereas Other and not specified registers (70.28%); in the *Netherlands* the most favoured field is Education science and teacher training (54.30%), with Social and behavioural sciences ranking second (14.18%); in *Norway* predominance falls to Education science and teacher training (10.89%), Commercial and business administration (20.33%) and Humanities, religion and theology (12—94%); while in *Switzerland* to Commercial and business administration (about 48.66%), and to Engineering (about 22.68%); in the *United Kingdom*, the top place is taken by Medical science and health-related sciences (about 26.38%), closely followed by Social and behavioural sciences (about 22.06), and by Engineering (16.12%); *Yugoslavia* registers the highest percentages in the fields of Social and behavioural sciences (27.46%), Engineering (18.05%) and Law (17.17%).

With specific reference to *levels and fields of study* (and the later years of available data) the countries may be characterised as follows: *Canada*, with high enrolment at level 6, the field of Mathematics and computer science account-

Table 2.9.

Part-time student enrolment by ISCED fields of study

(%)

FIELD OF STUDY / Country	Canada	Germany, Fed. Rep. of	Ireland	Nether-lands	Norway	Switzer-land	United Kingdom	Yugo-slavia
Year	1985	1985	1984	1985	1985	1985	1984	1984
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Education science and teacher training	10.11	15.98	1.14	54.30	20.89	1.70	6.89	11.43
Humanities, religion and theology	4.77	0.11	12.30	1.00	12.94	—	2.61	6.97
Fine and applied arts	1.88	0.72	—	5.81	0.23	0.64	0.75	0.20
Law	0.44	—	0.72	5.71	8.13	—	./.	17.17
Social and behavioural science	7.20	—	0.20	14.18	10.04	7.95	22.06	27.46
Commercial and business administration	14.68	9.75	5.64	4.61	20.33	48.66	./.	2.67
Mass communication and documentation	0.75	—	0.03	0.29	0.03	—	1.45	0.06
Home economics (Domestic science)	0.23	4.49	—	—	0.03	0.49	./.	0.14
Service trades	—	0.95	—	—	—	—	./.	2.19
Natural science	1.26	—	1.22	0.20	8.50	—	5.10	2.81
Mathematics and computer science	2.82	—	./.	0.00	0.16	—	./.	./.
Medical science and health-related sciences	3.25	—	2.12	4.91	2.38	0.92	26.38	1.78
Engineering	1.98	61.29	6.28	—	1.68	22.68	16.12	18.05
Architecture and town planning	0.13	—	0.00	—	0.06	—	./.	0.38
Trade, craft and industrial programmes	—	3.32	—	4.88	0.01	14.62	./.	0.64
Transport and communications	—	—	—	0.32	0.04	—	./.	3.06
Agriculture, forestry and fishery	0.20	0.09	0.07	0.44	0.16	2.34	0.13	2.94
Other and not specified	50.31	1.81	70.28	3.35	14.65	—	18.53	2.04

Notes: 0.00 — Indicates less than 0.01.
./. — Data included elsewhere with another category.
Ireland: Natural science also includes Mathematics and computer science.
United Kingdom: Data include the Open University. Law, Social and behavioural science, Commercial and business administration are presented together. Natural science also includes Mathematics and computer science. Engineering, Trade, craft and industrial programmes are presented together. Mass communication includes Home economics, Service trades, Architecture and town planning, Transport and communications.

ing for 91.68% (of the total of the field) and Agriculture, forestry and fishery, for 57.45%. Insignificant numbers are registered in level 5, where Commercial and business administration is at its highest (2.39% of the total of the field). Level 7 appears to be of intermediate importance, in comparison with the other two levels, and in which the highest proportion is registered by Agriculture, forestry and fishery (with 41.34%), and the lowest by Fine and applied arts (with 7.43%). On the whole, it may be observed that in Canada part-time higher education focusses on the higher levels, especially level 6. In the *Netherlands*. part-time students participate at all levels in the fields of Education science and teacher training, Fine and applied arts, Commercial and business administration, Mass communication and documentation, Medical science and health-related sciences, Trade, craft and industrial programmes, Transport and communications, Agriculture, forestry and fishery. On the other hand, levels 6 and 7 (level 7 data are however, included in level 6) account for all the part-time students in the fields of Humanities, religion and theology, Law, Natural science, Mathematics and computer science. Distribution by levels is only made in the field of Social and behavioural science (64.86% at level 5 and 35.04% at levels 6 and 7), as well as in that of Other and not specified (with 87.35% at level 5 and 12.64% at levels 6 and 7). In *Norway* the majority of student distribution is at level 5. In the fields of Trade, craft and industrial programmes and Transport and communications, all the part-time students are included in level 5. Level 5 accounts for a very large proportion of the fields of Commercial and business administration (98.17%), Fine and applied arts (94.44%), Humanities, religion and technology (54.94%). Mass communication and documentation (50%), Social and behavioural science (45.45%), and Architecture and town planning (44.44%). Level 6 comes second to level 5, and includes all part-time students in the field of Home economics. Very large percentages may be observed at level 6 in the fields of Education science and teacher training (94.87%), Agriculture, forestry and fishery (76%),Engineering (53.56%) and Mass communication and documentation (50%). Level 7 includes all part-time students in the field of Law, and also very high proportions of other fields, such as Medical science and health-related sciences (73.47%), Architecture and town planning (55.56%), Social and behavioural science (42.81%), Natural science (40.78%). The *United Kingdom* also presents higher percentages at level 5, with the top places taken by Medical science and health-related sciences (with 96.28% of the total of the field), Engineering (with 87.17%) Social and behavioural science (with 74.31%), Mass communication and documentation (with 57.06%) and Natural science (with 52.29%). Mention should be made that the data for the United Kingdom often groups several fields together (see the Note in Table 2.9.). Level 6 (the second strongest level) comprises the fields of Fine and applied arts (45.73%), Humanities, religion and theology (35.78%) and Education science and teacher training (22.51%). Level 7, which on the whole is the weakest level, is strong in some fields: Agriculture, forestry and fishery (66.19%), Humanities, religion and theology (47.18%), Fine and applied arts (36.06%), Education science and teacher training (32.26%) and Natural science (28.29%). In *Yugoslavia*, the students are distributed across levels 5 and 6, and level 5 is composed only of part-time students in the fields of Home economics and Trade, craft and industrial programmes. Level 5 also registers very high percentages in the fields of Medical science and health-related sciences (93.98%), Education science and teacher training (72.26%), Service trades (67.24%). Level 6 includes only students in the fields of Humanities, religion and theology, Fine and applied arts, Mass communication and documentation, Architecture and town planning, followed hierarchically by Natural science (with 96.49%) of the total of the fields), Law (96.36%), Agriculture, forestry and fishery (84.19%), Social and behavioural science (79.25%), Commercial and business administration (78%), Transport and communications (63.09%), Engineering (56.79%). In Yugoslavia level 6 is predominant. For the *FRG*, *Ireland* and *Switzerland* an analysis by levels and fields cannot be made, for the above-mentioned reasons.

The *proportion of sexes* should be primarily considered, in the total of part-time students, irrespective of level or field. Table 2.10. below illustrates how the situation differs considerably from one country to another. The female students are most numerous in Canada (59.56%), and least in number in Switzerland (17.05%). By levels of study — for the countries for which this division is possible — the analysis shows that level 5 registers the highest degree of female students: the Netherlands with 45.01% and the United Kingdom with 50.95%. In three other countries, the highest level of female student enrolment is at level 6: Canada (61.14), Norway (56.13%) and Yugoslavia (40.27%). By approaching the problem by fields of study, it becomes evident that in *Canada* the largest percentage of female students is in the field of Home economics (92.06%), followed by Medical science and health-related sciences (82.02%), Fine and applied art (70.65%), Education science and teacher training (69.43%), Humanities, religion and theology (67.73%), Social and behavioural science, Mass communication and documentation (64.06% in both). In the *FRG*, the highest places are taken by Home economics (99.78%), Education science and teacher training (88.63%) and the Service trade (84.82%)

Table 2.10.

The proportion of female students in the total of part-time students, by ISCED levels

Country	Year	All levels	Level 5	Level 6	Level 7
Canada	1985	59.56	56.64	61.14	46.34
FRG	1985	30.70	30.70	—	—
Ireland	1984	34.53	..	...	...
Netherlands	1985	44.17	45.01	38.16	—
Norway	1985	51.57	51.26	56.13	46.66
Switzerland	1985	17.06	17.06	—	—
United Kingdom	1984	47.27	50.95	44.94	31.67
Yugoslavia	1984	39.97	39.32	40.27	—

In *Ireland*, these are Humanities, religion and theology (with 67.13%), followed by Education science and teacher training (62.07%), and Social and behavioural science (61.29%). In the *Netherlands*, the highest proportion of female students are in the fields of Medical science and health-related sciences (65.65%), Mass communication and documentation (62.96%), Humanities, religion and theology (53.70%) and Fine and applied arts (50.07%). In *Norway*, remarkable from the point of view of female enrolment are the fields of Mass communication and documentation (66.67%), Humanities, religion and theology (61.60%), Education science and teacher training (59.97%), Medical science and health-related sciences (58,09%), Social and behavioural science (56.69%) and Trade, craft and industrial programmes (50%). In *Switzerland*, the predominance of female students is to be seen in the fields of Home economics (98.77%). Medical science and health-related sciences (74.34%), Fine and applied arts (67.92%) and Social and behavioural science (61.28%). In the *United Kingdom*, the female students predominate in the field of Medical science and health-related sciences (87.41%), followed by Fine and applied arts (56.36%), Humanities, religion and teacher training (53.27%) and the Humanities, religion and theology (54.03%). In *Yugoslavia*, the top places are taken by Medical science, and health-related sciences (82.63%), Home economics (72.93%), and the Humanities, religion and theology (59.73%). The smallest proportion of female students is to be observed in the field of Engineering (in Canada 8.83%, in the FRG 5.86%, in Switzerland 0.80%, in the United Kingdom 3.28% and in Yugoslavia 16.33%), in the field of Trade, craft and industrial programmes (in the FRG 0.89%, in the Netherlands 10.82%, in Switzerland 0.50%), in the field of Agriculture, forestry and fishery (in the FRG 5.56% (and in the field of Transport and communication (in the Netherlands 0.42).

3. FOREIGN STUDENTS ENROLLED IN THE COUNTRIES OF THE EUROPE REGION

3.1 Foreign students received in the countries of the Europe Region in proportion to the total student enrolment

An overview of the number of foreign students trained in the countries of the Europe Region (based on the latest available data) in proportion to the total of students enrolled in each country (Table 3.1.) reveals a number of characteristics which may be remarked upon. Bearing in mind that not all the data relate to the same year and that for some countries the data only refer to universities and equivalent establishments or only to full-time students, as mentioned in the proceedings of the " Experts' Consultation on the Application of the International Standard Classification of Education to Programmes of Education at the Third Level in Countries of the Europe Region" (Bucharest, May 11—13, 1987), one has difficulty in defining "foreign students", since a number of students born in these countries are classed as foreign citizens and in some countries, the essential criterion is the possession of a foreign passport. Approaches and definitions can differ widely. In the view of the International Institute of Education, a foreign student is defined as a person who is enrolled in courses at institutions of higher education in a given country, who is neither a citizen nor an immigrant (permanent resident); persons with refugee status are included. According to the Unesco definition, a foreign student is defined as a person enrolled at an institution of higher education in a country or territory in which he or she is not a permanent resident. It should, however, be noted that most of the countries have based their statistics concerning foreign students on nationality. The difference resulting from the application of the two above-mentioned criteria can, in certain countries, be quite appreciable; for example, as concerns those immigrants who have not adopted the nationality of the host country but who are permanent residents.

From an examination of the *total number* of foreign students, we can see that in 2 countries it is *over 100 thousand* (the United States of America 343,780 and France 131,979); in 2 countries it is of *50 to 100 thousand* (the FRG 79,354 and the USSR 66,700); in 4 countries it is of *20* to *50 thousand* (the United

Table 3.1.

The number of foreign students trained in the countries of the Europe Region in proportion to the total of student enrolment (the latest data available for the number of foreign students)

Country	Year	Total of student enrolment	Foreign students	The proportion of foreign students in the total student enrolment, %
Albania	1965	12 761	93	0.73
Austria (1)	1985	160 904	15 388	9.56
Belgium	1985	247 499	24 761	10.00
Bulgaria	1985	113 795	7 254	6.37
Canada	1985	1 294 194	29 496	2.28
Cyprus	1985	3 134	544	17.36
Czechoslovakia	1985	169 344	4 175	2.47
Denmark	1984	114 559	3 101	2.71
Finland (1)	1985	92 230	979	1.06
France (1)	1985	983 483	131 979	13.41
German Dem. Rep.	1985	432 672	9 231	2.13
Germany, Fed. Rep. of	1985	1 550 211	79 354	5.12
Greece	1982	137 453	6 683	4.86
Hungary	1985	99 344	2 485	2.50
Iceland	1976	4 035	120	2.97
Ireland (1)	1985	55 087	1 774	3.22
Israel (1)	1985	66 110	1 369	2.07
Italy	1984	1 181 953	27 548	2.33
Luxemburg	1983	982	83	8.45
Malta	1985	1 474	25	1.70
Netherlands (2)	1985	317 721	5 705	1.80
Norway	1980	79 117	1 140	1.44
Poland	1985	454 190	2 986	0.66
Portugal	1984	112 851	2 401	2.13
Romania	1985	159 798	10 774	6.74
Spain	1980	681 022	10 997	1.61
Sweden	1980	203 699	13 182	6.47
Switzerland	1985	110 111	17 396	15.80
Turkey	1985	449 414	7 021	1.56
United Kingdom (2)	1985	937 000	63 522	6.78
United States	1985	12 247 055	343 780	2.81
USSR	1985	5 147 200	66 700	1.30
Yugoslavia	1985	349 013	7 384	2.12

Sources: *Unesco Statistical Yearbook* 1975, 1978–79, 1983, 1986, 1987; *Higher Education and Economic Development in Europe*, Vol. II, CEPES, Bucharest, 1983; *Enseignement supérieur en Europe*, CEPES, Vol. XI, No. 1, 1986; Statistical Office of Unesco (Dec. 16th, 1987); *Higher Education in Europe*, CEPES, Vol. XIII, No. 3, 1988.

Notes: (1) Universities only.
(2) The data refer to full-time students only.

Kingdom 48,686, Canada 29,496, Italy 27,548 and Belgium 24,761); in 5 countries it is of *10 to 20 thousand* (Switzerland 17,396, Austria 15,388, Sweden 13,182, Spain 10,997 and Romania 10,774); in 5 countries it is of *5 to 10 thousand* (the GDR 9,231, Yugoslavia 7,384, Bulgaria 7,254, Turkey 7,021, Greece 6,683 and the Netherlands 5,705); in 9 countries it is of *1 to 5 thousand* (Czechoslovakia

4,175, Denmark 3,101, Poland 2,986, Ireland 2,684, Hungary 2,485, Portugal 2,401, Israel 1,369 and Norway 1,140); in 6 countries the figure is *below 1 thousand* (Finland 979, Cyprus 544, Iceland 120, Albania 93, Luxemburg 83 and Malta 25).

Concerning the *proportion of foreign students in the total student enrolment* in the countries of the Europe Region, there are 4 countries which record a percentage of *10% or more* (Cyprus 17.36, Switzerland 15.80, France 13.41 and Belgium 10.00); in 7 countries the proportions are *from 5 to 10%* (Austria 9.56, Luxemburg 8.45, the United Kingdom 6.78, Romania 6.74, Sweden 6.47, Bulgaria 6.37, and the FRG 5.12); in 19 countries the percentages range *from 1 to 5%* (Greece 4.86, Ireland 3.22, Iceland 2.97, the United States of America 2.81, Denmark 2.71, Hungary 2.50, Czechoslovakia 2.47, Italy 2.33, {the GDR 2.13, Portugal 2.13, Yugoslavia 2.12, Israel 2.07, the Netherlands 1.80, Malta 1.70, Spain 1.61, Turkey 1.56, Norway 1.44, the USSR 1.30, Finland 1.06); and in 2 countries the percentage is *below 1%* (Albania 0.73 and Poland 0.66).

3.2 The evolution of the number of foreign student enrolment in the countries of the Europe Region

An analysis of the information available for the 1980—1985 period concerning the *evolution of the number of foreign students enrolled in the countries of the Europe Region* (as presented in Table 3.2. containing the most recent and complete data available at the time of compilation) reveals some common and specific aspects in the countries of the Region, which can be grouped as follows:

— the number of foreign students *increases continually* in Austria, Denmark Finland, the GDR, the FRG, Luxemburg, the Netherlands, Portugal, Switzerland and the United States of America;

— there is a *general increasing trend* (with some decreases more or less significant in size) in the period, evident in Belgium, Bulgaria, Czechoslovakia, France, the United Kingdom and Yugoslavia;

— a *fluctuating evolution* with significant increases and decreases from year to year, evident in Canada, Cyprus, Malta, Poland and Turkey;

— there are *continual decreases* from year to year in the number of foreign students in Hungary;

— *a general decreasing trend*, with some fluctuations during the period, is evident in Ireland, Italy, Romania and Greece (there is a dramatic reduction recorded in Greece, from 7,673 foreign students in 1982 to 1,859 in 1984).

There are no available data for comparisons over the period for Iceland, Israel, Norway, Spain and Sweden.

Table 3.3. presents some characteristic aspects of the *relative evolution of the number of foreign students received in the countries of the Europe Region.* Thus, by comparing the data in the base year (1980) with those in the last year (1985, as a rule, only exceptions are shown in the Table), one can observe that some countries manifest important percentage increases over the entire period concerned and corresponding higher average annual rates, while other countries register decreases.

The following constitutes a list of the countries of the first group in decreasing order, according to their average annual rates (the average annual rate is being taken because the relative percentages cannot be computed for the same number of years for all countries): Luxemburg 19.1%, Portugal 16.1%,

Table 3.2.

The number of foreign students enrolled in higher education institutions in the countries of the Europe Region
1980–1985

Country	1980	1981	1982	1983	1984	1985
Austria (1)	11 848	12 885	13 515	13 943	14 858	15 388
Belgium	12 875	12 260	11 871	12 528	21 188	24 761
Bulgaria	3 988	4 642	5 587	5 459	6 060	7 254
Canada	28 443	32 303	35 566	35 365	32 625	29 496
Cyprus	331	434	179	332	351	544
Czechoslovakia	3 642	3 916	3 878	3 868	4 007	4 175
Denmark	3 035	3 048	3 055	3 084	3 101	. . .
Finland (1)	610	658	690	766	929	979
France (1)	110 763	108 607	134 566	130 244	133 848	131 979
German Dem. Rep.	7 106	7 411	7 987	8 472	9 143	9 231
Germany, Fed. Rep. of	61 841	67 216	71 393	74 267	76 918	79 354
Greece	7 673	8 304	6 683	. . .	1 859	. . .
Hungary	2 742	2 712	2 659	2 528	2 520	2 485
Ireland (1)	2 845	2 914	. . .	2 569	2 684	1 774
Israel	. . .	. . .	. . .	. . .	. . .	1 369
Italy	29 447	30 652	29 221	28 068	27 548	. . .
Luxemburg	49	51	81	83	. . .	. . .
Malta	36	26	20	26	30	25
Netherlands (2)	4 128	4 228	4 634	4 915	5 536	5 705
Norway	1 140	. . .	. . .	. . .	. . .	. . .
Poland	2 912	2 813	2 773	2 913	2 885	2 986
Portugal	1 318	1 678	1 994	2 155	2 401	. . .
Romania	15 888	16 962	16 251	14 808	13 068	10 774
Spain	10 997	. . .	. . .	. . .	. . .	. . .
Sweden	13 182	. . .	. . .	. . .	. . .	. . .
Switzerland	14 716	15 515	15 657	16 277	16 830	17 396
Turkey	6 655	6 378	6 030	5 524	6 732	7 021
United Kingdom (2)	56 003	50 684	46 000	45 416	48 686	63 522
United States	311 882	326 299	. . .	338 890	342 113	343 780
USSR	55 300	. . .	. . .	. . .	. . .	66 700
Yugoslavia	4 426	5 022	5 610	6 694	7 982	7 384

Sources: *Unesco Statistical Yearbook* 1986, 1987; *Enseignement supérieur en Europe* CEPES, Vol. XI, No. 1, 1986; Data supplied by the Statistical Office of Unesco (Dec. 16th, 1987).

Notes: (1) University only,
(2) The data refer to full-time students only.

Belgium 13.9%, Bulgaria 12.7%, Yugoslavia 10.8%, Cyprus 10.4%, Finland 9.9%, the Netherlands 6.7%, Austria 5.4%, the GDR 5.4%, the FRG 5.1%, the USSR 3.6%, France 3.5%, Switzerland 3.4%, the United Kingdom 3.0%, Czechoslovakia 2.9%, the United States of America 2.0%, Canada 0.8%, Turkey 0.8%, Poland 0.6%, and Denmark 0.5%.

The second group of countries, which register decreases (also presented according to their average annual rates), includes Italy – 1.5%, Hungary – 2.0%, Malta –7.6%, Romania –7.8%, Ireland –8.0%, and Greece –30.0%.

Table 3.3.

The relative evolution of the number of foreign students trained in the countries of the Europe Region

Country	Number in the base year		Number in the last year		Relative evolution (%)	Average annual rate (%)
	Year	Number	Year	Number		
Austria	1980	11 848	1985	15 388	130	5.4
Belgium	1980	12 875	1985	24 761	192	13.9
Bulgaria	1980	3 988	1985	7 254	182	12.7
Canada	1980	28 443	1985	29 496	104	0.8
Cyprus	1980	331	1985	544	164	10.4
Czechoslovakia	1980	3 642	1985	4 175	115	2.9
Denmark	1980	3 035	1984	3 101	102	0.5
Finland	1980	610	1985	979	160	9.9
France	1980	110 763	1985	131 979	119	3.5
German Dem. Rep.	1980	7 106	1985	9 231	130	5.4
Germany, Fed. Rep. of	1980	61 841	1985	79 354	128	5.1
Greece	1980	7 673	1984	1 859	24	−30.0
Hungary	1980	2 742	1985	2 485	91	−2.0
Ireland	1980	2 845	1985	1 774	61	−8.0
Italy	1980	29 447	1984	27 548	94	−1.5
Luxemburg	1980	49	1983	83	169	19.1
Malta	1980	36	1985	25	69	−7.6
Netherlands	1980	4 128	1985	5 705	138	6.7
Poland	1980	2 912	1985	2 986	103	0.6
Portugal	1980	1 318	1984	2 401	182	16.1
Romania	1980	15 888	1985	10 774	68	−7.8
Switzerland	1980	14 716	1985	17 396	118	3.4
Turkey	1980	6 655	1985	7 021	105	0.8
United Kingdom	1980	56 003	1985	63 522	113	3.0
United States	1980	311 882	1985	343 780	110	2.0
USSR	1980	55 300	1985	66 700	121	3.6
Yugoslavia	1980	4 426	1985	7 384	167	10.8

Sources: *Unesco Statistical Yearbook* 1975, 1978—1979, 1983, 1986, 1987; *Education and Economic Development in Europe*. Vol. I and II. CEPES Bucharest, 1983; *Enseignement supérieur en Europe*, CEPES, Vol. XI, No. 1, 1986; Data supplied by the Statistical Office of Unesco (Dec. 16th, 1987). URSS '88 Annuaire, Agence de presse Novosti, Moscou, 1988; *Statistics of Students from Abroad in the United Kingdom* 1985/6

3.3 Distribution of foreign students trained in the countries of the Europe Region by zone of origin

Within the limits of the available data, the following results emerge from an analysis of the distribution of foreign students received in the countries of the Europe Region by zone of origin (Tables 3.4. and 3.5.). Firstly, we can observe the *concentration of foreign students who are trained in the countries of the Europe Region according to their zone of origin* (i.e. proportion of students from each zone in the total number of foreign students in any given country). Thus, in the total number of foreign students trained in *Austria* in the base year, 64.3% come from Europe and 24.4% from Asia with percentages below 10% registered for the other zones: in the last year, the situation is very much the same (64.5% and 23.9%, respectively). In *Belgium*, the greatest proportion, in the base year, is held by the students from Africa (38.2%), Europe (36.2%) and Asia (14.4%), while in the last year, from Europe (50.0%), Africa (33.8%) and Asia (10%); note that in Belgium there is a substantial increase in the total number of foreign students (from 12,875 in 1980 to 24,761 in 1985) and similarly in the number of students coming from the European continent (from 4,665 in 1980, constituting 36.2% of the total number of foreign students, to 12,377 in 1985, constituting 50.0% of the total number). *Canada* registers the majority of students coming from Asia (50.4% in 1981 and 52.7% in 1985), with over 10% of students coming from North America, Africa, and Europe. Furthermore, there is a notable shift towards students from Africa (from 10.7% in 1981 to 15.3% in 1985). In *Czechoslovakia*, the greatest percentage is that of the students from Asia (45.1% in 1981 and 43.0% in 1985), with a decrease in the percentage of students from Europe (from 30.9% to 23.8%) and an increase in the percentage from Africa (from 13.6% to 21.5%). In *Denmark*, the majority of the students (77.6% in 1980 and 79.3% in 1984) come from Europe, the other zones registering percentages below 10%. *Finland* (for which there are available data only for the last year) is represented by the greatest proportion of students coming from Europe (45.1%), followed by Africa (18.8%), Asia (17.7%), and North America (11.8). In *France* (which registers the second highest number of foreign students received in the world), the highest percentage (52.8% in 1980 and 57.7% in 1984) is that of the students from Africa, and displays an increasing tendency in this direction. Africa is followed by Europe (16.8% and 16.6%) and Asia (17.7% and 16.2%), other zones registering percentages below 10%. In the *GDR*, most foreign students come from Asia (32.1% in 1981 and 39.2% in 1985), Europe (31.0% and 21.9%) and Africa (19.5% and 23.1). An increase in the percentages of students from Asia and Africa is evident and a decrease in the proportion of the students coming from Europe. In the *FRG*, the percentages are almost equal of those students coming from Asia (40.0% in 1980 and 41.7% in 1985) and from Europe (40.2% and 40.8%), with other zones registering percentages below 8%. In *Greece*, the main characteristic is that the greatest proportion of foreign students come from Asia (83.0% in 1979 and 82.8% in 1982), mainly from Cyprus. In *Hungary*, in the base year 1981, the greatest proportion of foreign students are received from Asia (34.8%), followed by Europe (34.2%) and Africa (16.9%). In the last year, 1985, the highest percentage is that of Europe (38.2%), followed by Asia (32.6%) and Africa (12.4%). In *Ireland*, most foreign students come from Europe (47.1% and 47.8% in 1980 and 1984, respectively), followed by Asia (14.0% and 23.8%), North America (13.1% and 15.1%) and Africa (14.7% and 11.8%). There is a notable increase in the proportion of foreign students coming from Asia and a decrease in those coming from Africa. *Italy* registers most students as coming from Europe (56.8% and 57.3% in 1980 and 1983, respectively), followed by Asia (26.1% and 28.8%) and other zones registering percentages below 8%. Furthermore, there is an increase in the proportions of the two zones of concentration of foreign students. The *Netherlands* also shows a preponderance of students coming from Europe (52.5% and 58.5% in 1981 and 1984, respectively) and from Asia (28.0% and 23.8%), with a perceptible increase in the European zone. In *Poland*, most students are registered as coming from Asia (36.1% and 51.0% in 1981 and 1985, respectively) and Africa (22.9% and 24.2%), reinforcing their positions. Europe also occupies an important place but it displays a relatively decreasing trend (18.7% and

Table 3.4.

The distribution of foreign students trained in the countries of the Europe Region by zone of origin — base year

Host country	Total	Student enrolment by zone of origin							
Year		Africa	America, North	America, South	Asia	Europe	Oceania	USSR	Not specified
1	2	3	4	5	6	7	8	9	10
Austria 1981	12 885 (100)	426 (3.3)	550 (4.3)	194 (1.5)	3 150 (24.4)	8 286 (64.3)	23 (0.2)	6 (0.0)	250 (1.9)
Belgium 1980	12 875 (100)	4 918 (38.2)	612 (4.8)	539 (4.2)	1 848 (14.4)	4 665 (36.2)	10 (0.0)	3 (0.0)	280 (2,2)
Canada 1981	32 303 (100)	3 458 (10.7)	5 577 (17.3)	1 023 (3.2)	16 296 (50.4)	4 653 (14.4)	295 (0.9)	7 (0.0)	994 (3.1)
Czechoslovakia 1981	3 916 (100)	533 (13.6)	158 (4.0)	40 (1.0)	1 765 (45.1)	1 212 (30.9)	— —	174 (4.4)	34 (0.9)
Denmark 1980	3 035 (100)	118 (3.9)	254 (8.4)	76 (2.5)	183 (6.0)	2 354 (77.6)	16 (0.5)	2 (0.0)	32 (1.1)
France 1980	114 181 (100)	60 308 (52.8)	4 905 (4.3)	5 342 (4.7)	20 161 (17.7)	19 166 (16.8)	170 (0.1)	— —	4 129 (3.6)
German Dem. Rep. 1981	7 411 (100)	1445 (19.5)	530 (7.2)	298 (4.0)	2 377 (32.1)	2 295 (31.0)	— —	466 (6.3)	— —
Germany, Fed. Rep. of 1980	61 841 (100)	4 153 (6.7)	4 506 (7.3)	2 260 (3.7)	24 756 (40.0)	24 838 (40.2)	140 (0.2)	62 (0.1)	1 126 (1.8)
Greece 1979	8 304 (100)	625 (7.5)	328 (3.9)	27 (0.3)	6 893 (83.0)	337 (4.1)	63 (0.8)	3 (0.0)	28 (0.3)
Hungary 1981	2 712 (100)	458 (16.9)	178 (6.6)	85 (3.1)	943 (34.8)	927 (34.2)	5 (0.0)	116 (4.3)	— —
Ireland 1980	2 845 (100)	417 (14.7)	374 (13.1)	2 (0.0)	397 (14.0)	1 341 (47.1)	21 (0.7)	— —	293 (10.3)
Italy 1980	27 784 (100)	1 620 (5.8)	1 701 (6.1)	1 303 (4.7)	7 239 (26.1)	15 792 (56.8)	74 (0.3)	12 (0.0)	43 (0.2)
Netherlands 1981	4 228 (100)	229 (5.4)	283 (6.7)	149 (3.5)	1 183 (28.0)	2 219 (52.5)	41 (1.0)	2 (0.0)	122 (2.9)
Poland 1981	2 813 (100)	643 (22.9)	420 (14.9)	178 (6.3)	1 016 (36.1)	527 (18.7)	9 (0.3)	17 (0.6)	3 (0.1)
Portugal 1979	1 079 (100)	502 (46.5)	24 (2.2)	388 (36.0)	14 (1.3)	99 (9.2)	3 (0.3)	— —	49 (4.5)
Spain 1980	10 997 (100)	409 (3.7)	1 272 (11.6)	2 264 (20.6)	1 496 ((13.6)	1 220 (11.0)	8 (0.1)	— —	4 328 (39.4)
Switzerland 1981	15 515 (100)	1 046 (6.7)	744 (4.8)	548 (3.5)	1 314 (8.5)	10 711 (69.0)	34 (0.2)	6 (0·0)	1 112 (7.2)

Table 3.4. (continued)

1	2	3	4	5	6	7	8	9	10
Turkey	6 378	159	9	—	5 412	449	1	—	348
1981	(100)	(2.5)	(0.1)	—	(84.9)	(7.0)	(0.0)	—	(5.5)
United Kingdom	56 003	11 749	3 876	1 558	26 712	6 349	718	10	5 031
1980	(100)	(21.0)	(6,9)	(2.8)	(47.7)	(11.3)	(1.3)	(0.0)	(9.0)
United States	325 628	41 399	41 437	29 181	180 458	28 507	3 936	430	280
1981	(100)	(12.7)	(12,7)	(9.0)	(55.4)	(8.8)	(1.2)	(0.1)	(0.0)
USSR	62 942	13 654	5 616	4 165	21 627	17 880	—	—	—
1978	(100)	(21.7)	(8.9)	(6.6)	(34.4)	(28.4)	—	—	—
Yugoslavia	4 426	749	70	41	2 681	802	17	26	40
1980	(100)	(16.9)	(1.6)	(0.9)	(60.6)	(18.1)	(0.4)	(0.6)	(0.9)

Source: Computed from the *Unesco Statistical Yearbook* 1983.

13.5% in 1981 and 1985, respectively), similarly North America (14.9% and 6.7%). In *Portugal*, most foreign students come from Africa (46.5% and 60.8% in 1979 and 1984, respectively) and South America (36.0% and 30.9%). There is a substantial increase in the interest of the students coming from Africa, with a corresponding decrease in the proportion of those coming from South America and Europe. *Spain*, for which there are only available data for 1980, shows most students coming from South America (20.6%), then Asia (13.6%), North America (11.6%) and Europe (11.0%). *Switzerland*, with a comparatively large number of foreign students, displays a preponderance of students from Europe (69.0% and 71.0% in 1981 and 1985, respectively), followed far behind by Asia (8.5% and 7.8%) with other zones registering perceptibly smaller weights. In *Turkey*, the main characteristic is that the major proportion of foreign students come from Asia (84.9% and 87.8% in 1981 and 1984, respectively), while the European zone accounts for 7.0% and 6.8% in the base and last years, respectively, other zones registering percentages below 4%. In the *United Kingdom*, most of the foreign students come from Asia (47.7% and 48.9% in 1980 and 1983, respectively), followed by Africa (with 31.0% and 22.3%) and Europe (11.3% and 16.3%), in which zones there is evidence of an increasing trend, while in other zones there is a corresponding decreasing trend. The *United States of America* (training the largest number of foreign students) registers students from Asia ranking first (55.4% and 52.3% in 1981 and 1985, respectively), North America (12.7% and 10.0%) and Africa (12.7% and 8.5%), while the students from Europe account for 8.8% of the places in the base year and 8.5% in the last year. In the *USSR*, the latest available data refer to 1978. The greatest proportion of students come from Asia (34.4%), followed by Europe (28.4%) and Africa (21.7%). In *Yugoslavia*, most foreign students come from Asia (60.6% and 50.2% in 1980 and 1984, respectively), followed by those from Europe (18.1% and 36.1%) and Africa (16.8% and 11.9%). There is therefore, an important increase in the proportion of the foreign students coming from Europe and a decrease in those coming from the other zones.

Table 3.5.

The distribution of foreign students trained in the countries of the Europe Region by the zone of origin — last year

Host country	Total	Student enrolment by zone of origin							
Year		Africa	America North	America, South	Asia	Europe	Oceania	USSR	Not specified
Austria	15 388	569	549	232	3 683	9 926	27	12	390
1985	(100)	(3,7)	(3.6)	(1.5)	(23.9)	(64.5)	(0.2)	(0.1)	(2.5)
Belgium	24 761	8 375	546	579	2 464	12 377	10	3	407
1985	(100)	(33.8)	(2.2)	(2.3)	(10.0)	(50.0)	(0.1)	(0.0)	(1.6)
Canada	29 496	4 527	4 412	629	15 539	3 753	256	2	378
1985	(100)	(15.3)	(15.0)	(2.1)	(52.7)	(12.7)	(0.9)	(0.0)	(1.3)
Czechoslovakia	4 175	896	239	98	1 794	993	—	140	15
1985	(100)	(21.5)	(5.7)	(2.3)	(43.0)	(23.8)	—	(3.4)	(0.3)
Denmark	3 101	65	221	66	265	2 460	11	5	8
1984	(100)	(2.1)	(7.1)	(2.1)	(8.5)	(79.3)	(0.4)	(0.2)	(0.3)
Finland	979	184	116	19	173	442	6	26	13
1985	(100)	(18.8)	(11.8)	(1.9)	(17.7)	(45.1)	(0.6)	(2.7)	(1.4)
France	133 848	77 261	5 992	4 998	21 750	22 252	147	113	1 335
1984	(100)	(57.7)	(4.5)	(3.7)	(16.2)	(16.6)	(0.2)	(0.1)	(1.0)
German Dem. Rep.	9 231	2 135	734	187	3 623	2 025	1	526	—
1985	(100)	(23.1)	(8.0)	(2.0)	(39.2)	(21.9)	(0.0)	(5.8)	—
Germany, Fed. Rep. of	79 354	4 614	5 272	2 579	33 041	32 303	175	92	1 278
1985	(100)	(5.8)	(6.6)	(3.2)	(41.7)	(40.8)	(0.2)	(0.1)	(1.6)
Greece	6 683	449	306	34	5 535	267	80	3	9
1982	(100)	(6.7)	(4.6)	(0.6)	(82.8)	(4.0)	(1.2)	(0.0)	(0.1)
Hungary	2 485	309	196	51	810	950	—	169	—
1985	(100)	(12.4)	(7.9)	(2.1)	(32.6)	(38.2)	—	(6.8)	—
Ireland	2 684	316	406	10	640	1 283	29	—	—
1984	(100)	(11.8)	(15.1)	(0.4)	(23.8)	(47.8)	(1.1)	—	—
Italy	28 068	1 984	1 122	748	8 067	16 090	32	8	17
1983	(100)	(7.1)	(4.0)	(2.7)	(28.8)	(57.3)	(0.1)	(0.0)	(0.0)
Netherlands	5 536	283	394	186	1 318	3 236	50	4	65
1984	(100)	(5.1)	(7.1)	(3.4)	(23.8)	(58.5)	(0.9)	(0.0)	(1.2)
Poland	2 986	724	200	121	1 522	402	9	8	—
1985	(100)	(24.2)	(6.7)	(4.1)	(51.0)	(13.5)	(0.3)	(0.2)	—
Portugal	2 401	1 460	61	741	17	113	9	—	—
1984	(100)	(60.8)	(2.5)	(30.9)	(0.7)	(4.7)	(0.4)	—	—
Switzerland	17 396	991	789	584	1 361	12 345	42	9	1 275
1985	(100)	(5.7)	(4.5)	(3.4)	(7.8)	(71.0)	(0.2)	(0.1)	(7.3)
Turkey	6 732	219	25	1	5 913	458	—	3	113
1984	(100)	(3.3)	(0.4)	(0.0)	(87.8)	(6.8)	—	(0.0)	(1.7)
United Kingdom	45 416	10 143	4 151	846	22 223	7 387	574	8	84
1983	(100)	(22.3)	(9.1)	(1.9)	(48,9)	(16.3)	(1.3)	(0.0)	(0.2)
United States	343 780	29 345	34 223	18 581	179 854	29 365	3 461	83	48 868
1985	(100)	(8.5)	(10.0)	(5.4)	(52.3)	(8.5)	(1.0)	(0.0)	(14.3)
Yugoslavia	7 982	946	81	19	4 007	2 883	12	15	19
1984	(100)	(11.9)	[illegible]	[illegible]	(50.2)	(36.1)	(0.2)	(0.2)	(0.2)

Source: Computed from the *Unesco Statistical Yearbook* 1987.

It may be further observed that in the total of foreign students received by each of the countries of the Europe Region, the *major enrolment zones* are as follows: *Africa:* Portugal (46.5% and 60.8% in the base and last years, respectively) and France (52.8% and 57.7%); *South America:* Spain 20.6% in 1980: *Asia:* Turkey (84.9% and 87.8% in the base and last years, respectively); similarly, Greece (83.0% and 82.8%), Yugoslavia (60.6% and 50.2%), the United States of America (55.4% and 52.3%), Canada (50.4% and 52.7%), the United Kingdom (47.7% and 48.9%), Czechoslovakia (45.1% and 43.0%), Poland (36.1 and 51.0%), the FRG (40.0% and 41.7%), the USSR (34.4% in 1978) and the GDR (32.1% and 39.2%); *Europe:* Denmark (77.6% and 79.3% in the base and last years, respectively), similarly, Switzerland (69.0% and 71.0%), Austria (64.3% and 64.5%), Italy 56.8% and 57.3%), the Netherlands (52.3% and 58.5%) and Ireland (47.1% and 47.8%). In *the other regions* there is no marked presence of any of the countries of the Europe Region.

Based on the most recent data available, the analysis of the *distribution of the foreign students from each zone by receiving countries* shows that the students coming from Africa are mostly trained in France (77,261), followed by the United States of America (29,345), the USSR (13,654) and the United Kingdom (10,143); the foreign students coming from *North America* are mostly trained in the United States of America (33,223), France (5,992), the USSR (5,616), the FRG (5,272), Canada (4,412) and the United Kingdom (4,151); the foreign students coming from *South America* are chiefly received by the United States of America (18,581), France (4,998), the USSR (4,165), the FRG (2,579) and Spain (2,264); the students from *Asia* are mainly trained in the United States of America (179,854), the FRG (33,041), the United Kingdom (22,223), France (21,750), the USSR (21,627) and Canada (15,539); the foreign students coming from *Europe* are mostly trained in the FRG (32,303), the United States of America (23,365), France (22,252), the USSR (17,880), Italy (16,090), Belgium (12,377) and Switzerland (12,345); those from *Oceania* are mostly received by the United States of America (3,461), the United Kingdom (574) and Canada (256); those from the *USSR* are mostly trained in the GDR (526), Hungary (169), Czechoslovakia (140), France (113), the FRG (92) and the United States of America (83).

In interpreting the data on the distribution of the foreign students in the countries of the Europe Region by zone of origin, one must bear in mind that there are no such data available for some countries training a significant number of foreign students: Romania, Sweden, and Bulgaria.

As to the *relative proportion of the receiving countries in the training of the foreign students from individual zones and worldwide* (Table 3.6.), one finds that 5 countries (the United States of America, France, the FRG, the USSR and the United Kingdom) share 70.4.% of the total, and the other 45 countries under consideration share the remaining 29.6%. The main share is held by the United States of America, with 36.9% of the world total, followed by France with 14.2%, the FRG 7.8%, the USSR 6.9% and the United Kingdom 4.6%.

3.4 Distribution of foreign students by country of origin in the Europe Region

If we are to consider the countries for which there are data available as to the distribution of foreign students trained in the Europe Region, by country of origin within the Region, in order to derive the optimum from these

Table 3.6.

Distribution of foreign students by world zone of origin in leading host countries

(The percentages are based on student numbers for each zone of origin)

Zone of origin	Host country						
	United States	France	FRG	USSR	United Kingdom	Total 5 leading countries	Next 45 countries
Africa	18.4	40.5	2.4	7.2	5.6	74.1	25.9
America, North	46.3	15.2	6.8	—	5.6	81.1	18.9
America, South	63.1	0.0	7.0	11.3	2.4	75.1	24.9
Middle East	30.9	7.6	12.9	—	4.3	56.6	43.4
South-East Asia	58.9	0.4	4.5	12.0	7.5	79.8	20.2
Europe	17.7	13.7	18.7	10.8	2.1	55.1	44.9
Oceania	48.4	2.0	2.4	—	4.1	65.9	34.1
USSR	17.1	0.0	7.5	—	0.6	25.7	74.3
% of world total:	36.9	14.2	7.8	6.9	4.6	70.4	29.6

Source: *Open Doors: 1986/87*, Report on International Educational Exchange, Institute of International Education, New York, N.Y., 1987, p. 9.

Note: The table takes into account not only the foreign students in the countries of the Europe Region but also worldwide. They only serve as a guide, in view of the different years and of the missing data for some countries.

data, we must begin by ascertaining the place occupied by this Region in the total number of foreign students, according to the latest information.

The *total number* of students originating from the countries of the Europe Region may be ordered by receiving country as follows: 1. the United States of America 48,780; 2. the FRG 48,044; 3. France 28,113; 4. Italy 18,510; 5. the USSR 17,880; 6. Switzerland 13,124; 6. Belgium 13,061; 7. the United Kingdom 11,698; 8. Austria 11,344; 9. Canada 6,426; 10. Greece 5,289; 11. the Netherlands 4,007; 12. Yugoslavia 3,110; 13. Denmark 2,741; 14. Turkey 1,723; 15. Spain 1,717; 16. Ireland 1,619; 17. Hungary 1,263; 18. Czechoslovakia 1,252; 19. Finland 599; 20. Poland 567; 21. Portugal 172.

As to the *proportion* of foreign students coming from the Europe Region in the total of foreign students received in each of these countries, the following order may be established (in %): 1. Denmark 88.4; 2. Greece 79.1; 3. Switzerland 75.4; 4. Austria 73.7; 5. the Netherlands 72.4; 6. Italy 65.9; 7. Finland 61.2; 8. the FRG 60.5; 9. Ireland 60.3; 10. Belgium 52.7; 11. Hungary 50.8; 12. Yugoslavia 39.0; 13. Czechoslovakia 30.0; 14. the USSR 28.4; 15. the United Kingdom 25.8; 17. Turkey 25.6; 18. Canada 21.8; 19. France 21.0; 20. Poland 19.0; 21. Spain 15.6; 22. the United States of America 14.2; 23. Portugal 7.2.

From the analysis of the distribution of the number of foreign students trained in the countries of the Europe Region by countries of origin within the Europe Region (Tables 3.7. and 3.8.) we may firstly observe the *countries of origin from which the most significant number of students come to be trained in the host countries*. Thus, in the total number of foreign students from the countries of the Europe Region who were trained in *Austria*, most of them come from the FRG (33.4% and 38.4% in the base and last years, respectively), from Italy (24.1% and 24.9%). In *Belgium*, most students come from Italy (13.7% and 24.5%), the Netherlands (19.7% and 13.3%) and France (10.2% and 12.0%). In *Canada*, the majority of students come from the United States of America (41.1% and 38.3%) and the United Kingdom (28.5% and 24.0%). *Czechoslovakia* is mostly chosen by students from the GDR (29.1% and 23.3%), Poland (16.1% and 19.1%), Bulgaria (15.0% and 12.6%) and the USSR (11.3% and 11.2%). *Denmark* is mainly applied to by students from Norway (25.8% and 34.2%), Iceland (17.3% and 22.2%), the FRG (12.0% and 11.4%) and Sweden (10.4%). *Finland* (for which there are available data only for the last year) mainly receives students from Sweden (19.3%), the United States of America (15.8%) and the FRG (15.0%). In *France*, the main proportion of students comes from Greece (16.0% and 13.0%), the FRG (10.3% and 13.0%) and the United States of America (11.6% and 12.6%). Most of the students received by the FRG come from Turkey (19.2% and 20.9%), Greece (14.8% and 13.9%), the United States of America (9.7% and 8.4%) and Austria (7.6% and 8.2%). *Greece* mostly receives students from Cyprus (80.6% and 80.0%), and from Turkey (8.4% and 8.1%). *Hungary* mainly receives students from the GDR (19.2% and 14.2%), Yugoslavia (14.7% and 14.6%), Poland (14.3% and 13.8%), Czechoslovakia (15.6% and 12.4%) and the USSR (9.9% and 13.4%). *Ireland* is chosen mainly by students from the United Kingdom (62.8% and 60.7%) and the United States of America (16.7% and 17.7%). In *Italy*, the greatest proportion of students comes from Greece (64.5% and 66.0%), then from the FRG (5.6% and 9.4%), Israel (7.6% and 6.3%) and the United States of America (7.7% and 5.2%). The *Netherlands* is favoured by the students from the FRG (29.1% and 29.9%), Belgium (13.0% and 10.9%), the United Kingdom (7.9% and 9.1%), and the United States of America (7.4% and 7.2%). *Poland* mainly receives students coming from the United States of America (28.8% and 18.8%), Greece (11.3% and 15.3%), Czechoslovakia (12.8% and 13.2%), Hungary (10.4% and 7.4%), Bulgaria (11.5% and 5.8%) and the FRG (3.2% and 11.6%). In *Portugal*, the major proportion of students comes from Spain (48.4% and 26.7%), the United States of America (18.0% and 23.4%) and the FRG (9.0% and 13.4%). *Spain* (the data for which only relate to the base year 1980) is chosen especially by students from the United States of America (32.3%), the FRG (11.5%) and France (10.8%). *Switzerland* mostly receives students from the FRG (28.7% and 29.0%), Italy (13.4% and 18.4%) and France (18.2% and 16.7%). *Turkey* mostly trains students from Cyprus (68.8% and 66.9%) and Greece (24.8% and 21.7%). The *United Kingdom* chiefly trains students from the United States of America (19.4% and 23.5%) and Greece (17.9% and 16.7%). Establishments in the *United States of America* chiefly receive students from Canada (29.6% and 27.1%) and the United Kingdom (11.0% and 10.4%). The latest data available for the year 1978 reveal that the *USSR* chiefly receives students from Bulgaria (25.6%), the GDR (25.4%), Poland (18.0%) and Hungary (15.1%). In *Yugoslavia*, most of the students come from Greece (52.8% and 85.0%).

The total number of foreign students who were trained in the countries of the Europe Region and who came from the same region stood at 241,039 as per the latest available data; this figure can be distributed over *the host countries in decreasing order as follows:* 1. the United States of America 48,780 students (i.e. 20.24% of the total); 2. the FRG 48,044 (19.93%); 3. France

The distribution of the number

Host Country	Year: base last	Total number in the Europe Region	1 Albania	2 Austria	3 Belgium	4 Bulgaria	5 Canada	6 Cyprus	7 Czecho-slovakia	8 Denmark	9 Finland
1. Austria	1981 1985	9720 11344	6 2	● ●	18 24	43 52	32 56	41 149	48 55	17 24	105 88
2. Belgium	1980 1985	5270 13061	1 6	14 385	● ●	7 753	50 76	7 17	4 7	10 37	8 17
3. Canada	1981 1985	8537 6426	— —	19 13	61 56	3 1	● ●	74 46	5 1	18 36	33 24
4. Czechoslovakia	1981 1985	1538 1252	— —	2 —	1 —	231 158	— —	83 71	● ●	1 —	— —
5. Denmark	1980 1984	2623 2741	— —	18 20	12 5	4 3	25 31	— —	10 10	● ●	64 40
6. Finland	... 1985	... 599	... —	... 12	... 5	... 8	... 18	... 1	... 4	... 12	● ●
7. France	1980 1984	25258 28113	— 45	— 174	739 887	— 67	798 949	847 467	— 58	— 185	— 146
8. Germany, Fed. Rep. of	1980 1985	36551 48044	1 3	2779 3960	542 586	127 115	330 429	318 686	656 603	247 269	826 702
9. Greece	1979 1982	6358 5289	169 100	3 5	1 2	5 1	52 48	5127 4229	— 7	5 4	6 3
10. Hungary	1981 1985	1169 1263	— —	— 1	— 1	105 112	6 14	53 37	182 157	— —	3 5
11. Ireland	1980 1984	1697 1619	— —	2 2	10 18	— —	66 59	2 —	— —	4 7	5 4
12. Italy	1980 1983	19269 18510	10 21	59 56	141 95	22 19	148 93	225 228	18 15	17 17	25 28
13. Netherlands	1981 1984	2781 4007	2 2	62 85	361 436	2 8	54 81	2 —	13 12	21 36	25 37
14. Poland	1981 1985	868 567	— —	2 2	3 2	100 33	36 10	38 30	111 75	— —	5 3
15. Portugal	1979 1984	122 172	— —	— —	1 4	1 —	1 20	— —	— —	7 —	— —
16. Spain	1980 ...	1811 ...	— ...	21 ...	55 ...	— ...	6 ...	— ...	— ...	1 ...	— ...
17. Switzerland	1981 1985	11728 13124	2 —	423 512	161 170	12 7	103 138	18 21	295 143	40 39	64 49
18. Turkey	1981 1984	1559 1723	— —	— 2	— —	38 17	— 2	1072 1153	— 1	— 1	4 1
19. United Kingdom	1980 1983	11123 11698	— —	32 42	61 264	7 8	660 626	1062 779	3 4	34 94	46 27
20. United States	1981 1985	50437 48780	5 —	320 344	780 639	7 25	14950 13227	1060 1834	46 28	460 469	470 478
21. U S S R	1978 ...	17880 ...	— ...	— ...	— ...	4571 ...	— ...	— ...	2597 ...	— ...	— ...
22. Yugoslavia	1980 1984	1053 3110	1 —	18 8	4 5	29 14	15 30	62 38	20 6	1 1	1 1

Source: *Unesco Statistical Yearbook* 1983, 1987

BEST COPY AVAILABI

the number of foreign students trained in the countries of the Europe Region by countries of origin within the same region

	Country of origin														
rk	9 Finland	10 France	11 German Dem. Rep.	12 Germany, Fed. Rep. of	13 Greece	14 Hungary	15 Iceland	16 Ireland	17 Israel	18 Italy	19 Luxemburg	20 Malta	21 Netherlands	22 Norway	23 Pola
7 4	105 88	128 121	4 14	3246 4352	661 572	68 92	7 11	13 11	39 35	2343 2825	345 351	3 1	39 44	67 46	23 24
0 7	8 17	540 1563	1 2	562 713	382 843	1 6	3 —	20 23	68 62	722 3201	627 1017	— 8	1036 1734	37 34	5 7
8 6	33 24	536 599	19 9	274 279	522 400	12 8	49 40	98 147	137 83	67 85	2 1	5 12	105 99	59 67	6 3
1 —	— —	— 1	447 292	— 1	91 101	76 66	— —	— —	65 44	1 —	— —	— —	— —	1 —	24 23
—	64 40	97 69	1 5	316 312	16 13	5 1	453 608	13 9	9 13	19 22	1 1	1 —	65 52	677 663	2 2
2	● ●	... 19	... —	... 90	... 5	... 13	... 16	... 2	... 5	... 14	... —	... —	... 15	... 17	... 2
5	— 146	● ●	— 56	2610 3643	4037 3649	— 94	— 67	— 198	275 217	1453 1453	920 996	— 15	383 495	— 190	53 85
7 9	826 702	2655 2654	— —	● ●	5417 6693	309 349	116 205	107 171	461 662	1441 2266	692 958	4 6	1600 1985	745 808	44 156
5 4	6 3	15 8	— —	20 42	● ●	— —	— —	— —	35 63	19 19	— 2	— —	5 4	2 —	— —
—	3 5	5 3	225 179	15 71	22 20	● ●	— 1	— —	28 26	1 2	— —	1 —	— 1	— 3	16 17
4 7	5 4	19 51	— 118	67 —	3 6	— —	2 2	● ●	3 2	10 8	7 5	7 4	14 10	60 23	—
7 7	25 28	357 336	164 49	1077 1740	12436 12222	14 11	— 2	10 7	1470 1163	● ●	11 18	17 19	32 55	31 24	4 5
21 36	25 37	109 135	5 8	808 1198	59 72	9 12	11 14	10 16	75 60	127 200	10 9	— —	● ●	51 98	
—	5 3	15 15	— 22	28 66	98 87	90 42	— —	1 —	— 10	— 2	— —	— —	— 2	1 1	● ●
7 —	— —	3 16	— —	11 23	— 3	1 —	— —	— —	— —	6 6	— —	— —	3 3	— —	
1 —	— ...	195 ...	— ...	208 ...	87 ...	— ...	— ...	— ...	— ...	138 ...	— ...	— ...	34 ...	14 ...	— ...
0 9	64 49	2140 2192	4 1	3371 3810	407 437	103 81	2 6	19 24	56 45	1570 2415	161 147	2 3	259 241	137 157	1
1	4 1	— 1	— —	7 15	387 373	— 2	— —	— —	29 85	5 12	— —	— —	1 3	— —	—
4 4	46 27	257 717	11 5	249 1236	1993 1959	9 7	99 43	334 525	179 142	122 374	7 47	128 77	144 341	413 737	
0 9	470 478	2990 3161	18 79	3640 4060	4220 3809	57 141	360 489	690 885	2550 2229	1450 1618	32 39	29 33	1380 1211	1300 1560	5 5
—	— ...	— ...	4534 ...	— ...	— ...	2694 ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	— ...	32 ...
1 1	1 1	3 7	8 2	29 68	556 2644	25 33	— 1	4 1	4 2	56 37	— —	— —	3 4	— —	

BEST COPY AVAILABLE

origin within the same region

Table 3.7.

20 Malta	21 Netherlands	22 Norway	23 Poland	34 Portugal	25 Romania	26 Spain	27 Sweden	28 Switzerland	29 Turkey	30 United Kingdom	31 United States	32 U S S R	33 Yugoslavia
3 1	39 44	67 46	233 246	20 31	20 22	54 61	62 71	207 237	830 828	121 130	475 404	6 12	347 377
— 8	1036 1734	37 34	50 77	156 245	7 11	224 1102	20 28	59 152	137 337	151 267	340 264	3 3	23 71
5 12	105 99	59 67	68 31	79 94	2 1	46 54	32 32	66 69	157 97	2433 1540	3509 2462	7 2	23 38
— —	— —	1 —	248 238	30 23	— —	— 2	— —	— —	1 4	1 —	3 —	174 140	82 111
1 —	65 52	677 663	26 26	10 6	4 3	20 16	272 286	51 41	13 56	179 210	220 183	2 5	18 32
... —	... 15	... 17	... 24	... 2	... 4	... 5	... 115	... 16	... 13	... 40	... 94	... 26	... 4
— 15	383 495	— 190	539 854	1587 2197	— 201	2139 3122	— 294	496 450	1234 854	2162 2054	2938 3549	— 113	2101 374
4 6	1600 1985	745 808	447 1564	285 501	188 193	1022 1659	421 493	1183 1302	7011 10060	1499 1960	3531 4042	62 92	1439 2068
— —	5 4	2 —	1 —	— —	10 5	4 —	1 2	2 1	533 427	53 58	271 252	3 3	9 4
1 —	— 1	— 3	167 174	10 7	10 16	— —	4 9	3 5	1 —	2 1	38 65	116 169	172 184
7 4	14 10	60 23	2 —	4 2	— —	11 16	7 5	9 5	1 3	1065 982	284 287	— —	— —
17 19	32 55	31 24	48 55	25 23	57 51	59 65	34 41	509 520	134 135	214 174	1488 976	12 8	224 244
— —	● ●	51 98	29 67	39 52	16 16	89 164	32 74	82 94	222 338	220 364	207 289	2 4	27 26
— —	— 2	1 1	● ●	9 —	1 1	2 —	15 10	1 2	— 1	13 10	250 107	17 8	30 26
— —	3 3	— —	2 1	● ●	— —	59 46	1 —	2 1	— —	5 9	22 40	— —	— —
— ...	34 ...	14 ...	— ...	171 ..	— ...	● ●	13 ...	55 ...	— ...	83 ...	585 ...	— ...	16 ...
2 3	259 241	137 157	85 179	110 93	51 69	501 695	117 134	● ●	295 252	329 342	539 541	6 9	170 174
— —	1 3	— —	— 5	— —	— —	1 —	— —	— —	● ●	2 15	9 22	— 3	4 10
128 77	144 341	413 737	27 59	231 147	2 4	151 216	77 62	190 221	700 158	● ●	2163 2751	10 8	90 18
29 33	1380 1211	1300 1560	540 599	460 469	62 60	1120 1495	1170 1204	970 853	2940 2109	5540 5097	● ●	430 83	370 453
— ...	— ...	— ...	3225 ...	— ...	15 ...	— ...	— ...	— ...	— ...	— ...	— ...	● ●	244 ..
— —	3 4	— —	38 17	— —	2 8	— —	2 5	— 4	101 114	2 4	43 41	26 15	● ●

BEST COPY AVAILABLE

The proportion of countrie

Host Country	Year: base / last	1 Albania	2 Austria	3 Belgium	4 Bulgaria	5 Canada	6 Cyprus	7 Czecho-slovakia	8 Denmark	9 Finland
1. Austria	1981	0.0	●	0.2	0.4	0.3	0.4	0.5	0.2	1.1
	1985	0.0		0.2	0.5	0.5	1.3	0.5	0.2	0.8
2. Belgium	1980	0.0	0.3	●	0.1	0.9	0.1	0.0	0.2	0.2
	1985	0.0	2.9		5.8	0.6	0.1	0.0	0.3	0.1
3. Canada	1981	—	0.2	0.7	0.0	●	0.9	0.0	0.2	0.4
	1985	—	0.2	0.9	0.0		0.7	0.0	0.6	0.4
4. Czechoslovakia	1981	—	0.1	0.0	15.0	—	5.4	●	0.0	—
	1985	—	—	—	12.6	—	5.7		—	—
5. Denmark	1980	—	0.7	0.5	0.2	1.0	—	0.4	●	2.4
	1984	—	0.7	0.2	0.1	1.1	—	0.4		1.5
6. Finland	...	...	...	...	...	...	...	...	...	●
	1985	—	2.0	0.8	1.3	3.0	0.2	0.7	2.0	
7. Fra[illegible]	1980	—	—	2.9	—	3.2	3.4	—	—	—
	1984	0.2	0.6	3.2	0.2	3.4	1.7	0.2	0.7	0.5
8. Germany, Fed. Rep. of	1980	0.0	7.6	1.5	0.3	0.9	0.9	1.8	0.7	2.3
	1985	0.0	8.2	1.2	0.2	0.9	1.4	1.3	0.6	1.5
9. Greece	1979	2.7	0.0	0.0	0.1	0.8	80.6	—	0.1	0.1
	1982	1.9	0.1	0.0	0.0	0.9	80.0	0.1	0.1	0.0
10. Hungary	1981	—	—	—	9.0	0.5	4.5	15.6	—	0.3
	1985	—	0.0	0.0	8.9	1.1	2.9	12.4	—	0.4
11. Ireland	1980	—	0.1	0.6	—	3.9	0.1	—	0.2	0.3
	1984	—	0.1	1.1	—	3.6	—	—	0.4	0.2
12. Italy	1980	0.0	0.3	0.7	0.1	0.8	1.2	0.0	0.0	0.1
	1983	0.1	0.3	0.5	0.1	0.5	1.2	0.1	0.1	0.2
13. Netherlands	1981	0.1	2.2	13.0	0.1	1.9	0.1	0.5	0.8	0.9
	1984	0.0	2.1	10.9	0.2	2.0	—	0.3	0.9	0.9
14. Poland	1981	—	0.2	0.3	11.5	4.1	4.4	12.8	—	0.6
	1985	—	0.4	0.4	5.8	1.8	5.3	13.2	—	0.5
15. Portugal	1979	—	—	0.1	0.1	0.1	—	—	5.7	—
	1984	—	—	2.3	—	11.6	—	—	—	—
16. Spain	1980	—	1.2	3.0	—	0.3	—	—	0.0	—
	...	...	...	...	...	...	...	..	...	...
17. Switzerland	1981	0.0	3.6	1.4	0.1	0.9	0.2	2.5	0.3	0.5
	1985	—	3.9	1.3	0.1	1.1	0.2	1.1	0.3	0.4
18. Turkey	1981	—	—	—	2.4	—	68.8	—	—	0.3
	1984	—	0.1	—	1.0	0.1	66.9	0.0	0.0	0.0
19. United Kingdom	1980	—	0.3	0.5	0.0	5.9	9.5	0.0	0.3	0.4
	1983	—	0.4	2.3	0.0	5.4	6.7	0.0	0.8	0.3
20. United States	1981	0.0	0.6	1.5	0.0	29.6	2.1	0.1	0.9	0.9
	1985	—	0.7	1.3	0.1	27.1	3.8	0.1	1.0	1.0
21. U S S R	1978	—	1.7	—	25.6	—	—	1.9	—	—
	...	...	...	...	...	...	...	...	...	...
22. Yugoslavia	1980	0.1	—	0.4	2.8	1.4	5.9	14.5	0.1	0.1
	1984	—	0.3	0.2	0.5	1.0	1.2	0.2	0.0	0.0

Note: 0.0 indicates lesser values than 0.1.

BEST COPY AVAILABLE

of countries of origin in the total number of foreign students trained in each of the countries of the Europe Region

Country of origin														
9 Finland	10 France	11 German Dem. Rep.	12 Germany, Fed. Rep.	13 Greece	14 Hungary	15 Iceland	16 Ireland	17 Israel	18 Italy	19 Luxemburg	20 Malta	21 Nether-lands	22 Norway	23 Poland
1.1 0.8	1.3 1.1	0.0 0.1	33.4 38.4	6.8 5.0	0.7 0.8	0.0 0.1	0.1 0.1	0.4 0.3	24.1 24.9	3.5 3.1	0.0 0.0	0.4 0.4	0.7 0.4	2.4 2.2
0.2 0.1	10.2 12.0	0.0 0.0	10.7 5.5	7.2 6.5	0.0 0.0	0.0 —	0.4 0.2	1.3 0.5	13.7 24.5	11.9 7.8	— 0.1	19.7 13.3	0.7 0.3	0.9 0.6
0.4 0.4	6.3 9.3	0.2 0.1	3.2 4.4	6.1 6.2	0.1 0.1	0.6 0.6	1.1 2.3	1.6 1.3	0.8 1.3	0.0 0.0	0.0 0.2	1.2 1.5	0.7 1.0	0.8 0.5
— —	— 0.0	29.1 23.3	— 0.0	5.9 8.1	4.9 5.3	— —	— —	4.2 3.5	0.0 —	— —	— —	— —	0.0 —	16.1 19.1
2.4 1.5	3.7 2.5	0.0 0.2	12.0 11.4	0.6 0.5	0.2 0.0	17.3 22.2	0.5 0.3	0.3 0.5	0.7 0.8	0.0 0.0	0.0 —	2.5 1.9	25.8 24.2	1.0 0.9
●	... 3.2	... —	... 15.0	... 0.8	... 2.2	... 2.7	... 0.3	.. 0.8	... 2.3	... —	... —	... 2.5	... 2.8	... 4.0
— 0.5	●	— 0.2	10.3 13.0	16.0 13.0	— 0.3	— 0.2	— 0.7	1.1 0.8	5.8 5.2	3.6 3.5	— 0.1	1.5 1.8	— 0.7	2.1 3.0
2.3 1.5	7.3 5.5	— —	●	14.8 13.9	0.8 0.7	0.3 0.4	0.3 0.4	1.3 1.4	3.9 4.7	1.9 2.0	0.0 0.0	4.4 4.1	2.0 1.7	1.2 3.3
0.1 0.0	0.2 0.[illegible]	— —	0.3 0.8	●	— —	— —	— —	0.6 1.2	0.3 0.4	— 0.0	— —	0.1 0.1	0.0 —	0.0 —
0.3 0.4	0.4 0.2	19.2 14.2	1.3 5.6	1.9 1.6	●	— 0.0	— —	2.4 2.1	0.1 0.2	— —	0.1 —	— 0.0	— 0.2	14.3 13.8
0.3 0.2	1.1 3.2	— 7.3	3.9 —	0.2 0.4	— —	0.1 0.1	●	0.2 0.1	0.6 0.5	0.4 0.3	0.4 0.2	0.8 0.6	3.5 1.4	0.1 —
0.1 0.2	1.9 1.8	0.9 0.3	5.6 9.4	64.5 66.0	0.0 0.1	— 0.0	0.0 0.0	7.6 6.3	●	0.0 0.1	0.0 0.1	0.2 0.3	0.2 0.1	0.2 0.3
0.9 0.9	3.9 3.4	0.2 0.2	29.1 29.9	2.1 1.8	0.3 0.3	0.4 0.3	0.4 0.4	2.7 1.5	4.6 5.0	0.4 0.2	— —	●	1·8 2.4	1.0 1.7
0.6 0.5	1.7 2.6	— 3.9	3.2 11.6	11.3 15.3	10.4 7.4	— —	0.1 —	— 1.8	— 0.4	— —	— —	— 0.4	0.1 0.2	●
— —	2.5 9.3	— —	9.0 13.4	— 1.7	0.8 —	— —	— —	— —	4.9 3.5	— —	— —	2.5 1.7	— —	2.0 0.6
— ...	10.8 ...	— ...	11.5 ...	4.8 ...	— ...	— ...	— ...	— ...	7.6 ...	— ...	— ...	1.9 ...	0.8 ..	— ...
0.5 0.4	18.2 16.7	0.0 0.0	28.7 29.0	3.5 3.3	0.9 0.6	0.0 0.0	0.2 0.2	0.5 0.3	13.4 18.4	1.4 1.1	0.0 0.0	2.2 1.8	1.2 1.2	0.7 1.4
0.3 0.0	— 0.0	— —	0.4 0.9	24.8 21.7	— 0.1	— —	— —	1.9 4.9	0.3 0.7	— —	— —	0.0 0.2	— —	— 0.3
0.4 0.3	2.3 6.1	0.1 0.0	2.2 10.2	17.9 16.7	0.0 0.0	0.9 0.4	3.0 4.5	1.6 1.2	1.1 3.2	0.0 0.4	1.2 0.7	1.3 2.9	3.7 6.3	0.2 0.5
0.9 1.0	5.9 6.5	0.0 0.2	7.2 8.3	8.4 7.8	0.1 0.3	0.7 1.0	1.4 1.8	5.1 4.6	2.9 3.3	0.1 0.1	0.1 0.1	2.7 2.5	2.6 3.2	1.1 1.2
— ...	— ...	25.4 ...	— ...	— ...	15.1 ...	— ..	— ...	— ...	— ...	— ...	— ...	— ...	— ..	18.0 ..
0.1 0.0	0.3 0.2	0.8 0.0	2.8 2.2	52.8 85.0	2.4 1.1	— 0.0	0.4 0.0	0.4 0.1	5.3 1.2	— —	— —	0.3 0.1	— —	3.6 0.5

BEST COPY AVAILABLE

Table 3.8.

ries of the Europe Region

19 emburg	20 Malta	21 Netherlands	22 Norway	23 Poland	24 Portugal	25 Romania	26 Spain	27 Sweden	28 Switzerland	29 Turkey	30 U.K.	31 U.S.	32 USSR	33 Yugoslavia
.5 3.1	0.0 0.0	0.4 0.4	0.7 0.4	2.4 2.2	0.2 0.3	0.2 0.2	0.6 0.5	0.6 0.6	2.1 2.1	8.5 7.3	1.2 1.1	4.9 3.6	0.0 0.1	3.6 3.3
1.9 .8	— 0.1	19.7 13.3	0.7 0.3	0.9 0.6	3.0 1.9	0.1 0.1	4.3 8.4	0.4 0.2	1.1 1.2	2.6 2.6	2.9 2.0	6.5 2.0	0.0 0.0	0.4 0.5
.0 .0	0.0 0.2	1.2 1.5	0.7 1.0	0.8 0.5	0.9 1.5	0.0 0.0	0.5 0.9	0.4 0.5	0.8 1.0	1.8 1.5	28.5 24.0	41.1 38.3	0.0 0.0	0.3 0.6
— —	— —	— —	0.0 —	16.1 19.1	2.0 1.8	— —	— 0.2	— —	— —	0.0 0.3	0.0 —	0.2 —	11.3 11.2	5.3 8.9
0.0 0.0	0.0 —	2.5 1.9	25.8 24.2	1.0 0.9	0.4 0.2	0.2 0.1	0.8 0.6	10.4 10.4	1.9 1.5	0.5 2.0	6.8 7.7	8.4 6.7	0.1 0.2	0.7 1.2
... —	... —	... 2.5	... 2.8	... 4.0	... 0.3	... 0.7	... 0.8	... 19.3	... 2.7	... 2.1	.. 6.7	... 15.8	... 4.3	... 0.7
3.6 3.5	— 0.1	1.5 1.8	— 0.7	2.1 3.0	6.3 7.8	— 0.7	8.5 11.1	— 1.0	2.0 1.6	4.9 3.0	8.6 7.3	11.6 12.6	— 0.4	8.3 1.3
1.9 .0	0.0 0.0	4.4 4.1	2.0 1.7	1.2 3.3	0.8 1.0	0.5 0.4	2.8 3.5	1.2 1.0	3.2 2.7	19.2 20.9	4.1 4.1	9.7 8.4	0.2 0.2	3.9 4.3
— 0.0	— —	0.1 0.1	0.0 —	0.0 —	— —	0.2 0.1	0.0 —	0.0 0.0	0.0 0.0	8.4 8.1	0.8 1.1	4.3 4.8	0.0 0.0	0.1 0.1
— —	0.1 —	— 0.0	— 0.2	14.3 13.8	0.9 0.6	0.9 1.3	— —	0.3 0.7	0.3 0.4	0.1 —	0.2 0.0	3.3 5.1	9.9 13.4	14.7 14.6
.4 0.3	0.4 0.2	0.8 0.6	3.5 1.4	0.1 —	0.2 0.1	— —	0.6 1.0	0.4 0.3	0.5 0.3	0.0 0.2	62.8 60.7	16.7 17.7	— —	— —
.0 .1	0.0 0.1	0.2 0.3	0.2 0.1	0.2 0.3	0.1 0.1	0.3 0.3	0.3 0.4	0.2 0.2	2.6 2.8	0.7 0.7	1.1 0.9	7.7 5.2	0.1 0.0	1.2 1.1
.4 .2	— —	●	1.8 2.4	1.0 1.7	1.4 1.3	0.6 0.4	3.2 4.0	1.2 1.8	2.9 2.3	8.0 8.4	7.9 9.1	7.4 7.2	0.1 0.0	1.0 0.6
— —	— —	— 0.4	0.1 0.2	●	1.0 —	0.1 0.2	0.2 —	1.7 1.8	0.1 0.4	— 0.2	1.5 1.8	28.8 18.8	2.0 1.4	3.5 4.6
— —	— —	2.5 1.7	— —	2.0 0.6	●	— —	48.4 25,7	0.8 —	2.0 0.6	— —	4.1 5.2	18.0 23.4	— —	— —
— ..	— ...	1.9 ...	0.8 ..	— ...	9.4 ...	— ...	●	0.7 ...	3.0 ...	— ...	4.6 ...	32.3 ...	— ...	0.9 ...
.4 .1	0.0 0.0	2.2 1.8	1.2 1.2	0.7 1.4	0.9 0.7	0.4 0.5	4.3 5.3	1.0 1.0	●	2.5 1.9	2.8 2.6	4.6 4.1	0.0 0.1	1.4 1.3
— —	— —	0.0 0.2	— —	— 0.3	— —	— —	0.0 —	— —	— —	●	0.1 0.9	0.6 1.3	— 0.2	0.3 0.6
.0 0.4	1.2 0.7	1.3 2.9	3.7 6.3	0.2 0.5	2.1 1.3	0.0 0.0	1.4 1.8	0.7 0.5	1.7 1.9	6.3 1.4	●	19.4 23.5	0.0 0.0	0.8 0.2
0.1 0.1	0.1 0.1	2.7 2.5	2.6 3.2	1.1 1.2	0.9 1.0	0.1 0.1	2.2 3.1	2.3 2.5	1.9 1.7	5.8 4.3	11.0 10.4	●	0.9 0.2	0.7 0.9
— ...	— ...	—	— ..	18.0 ..	— ...	0.1 ...	— ...	— ...	— ...	— ...	— ...	— ...	●	1.4 ...
— —	— —	0.3 0.1	— —	3.6 0.5	— —	0.2 0.3	— —	0.2 0.2	— 0.1	9.6 3.7	0.2 0.1	4.1 1.3	2.5 0.5	●

BEST COPY AVAILABLE

28,113 (11.66%); 4. Italy 18,510 (7.68%); 5. the USSR 17,880 (7.42%); 6. Switzerland 13,124 (5.45%); 7. Belgium 13,061 (5.42%); 8. the United Kingdom 11,698 (4.85%); 9. Austria 11,344 (4.71%); 10. Canada 6,426 (2.67%); 11. Greece 5,289 (2.19%); 12. the Netherlands 4.007 (1.66%); 13. Yugoslavia 3,110 (1.29%); 14. Denmark 2,741 (1.14%); 15. Spain 1,717 (0.71%); 16. Turkey 1,723 (0.71%); 17. Ireland 1,619 (0.67%); 18. Czechoslovakia 1,252 (0.52%); 19. Hungary 1,263 (0.52%); 20. Finland 599 (0.25%); 21. Poland 567 (0.24%); and 22. Portugal 172 (0.07%).

The total number of students *trained in other countries of the Europe Region may be distributed regarding their country of origin (also the Europe Region)*, as follows: 1. Greece sends 33,993 students to other countries of the Region that is 14.08% of the total of 241,039; 2. the FRG 21,927 (9.08% of the total); 3. The United States of America 16,983 (7.04%); 4. Canada 15,913 (6.59%); 5. Turkey 15,786 (6.54%); 6. Italy 14,697 (6.09%); 7. the United Kingdom 13,340 (5.53%); 8. France 11,863 (4.91%); 9. Cyprus 9,786 (4.05%); 10. Spain 8,718 (3.61%); 11. Poland 7,441 (3.08%); 12. The Netherlands 6,333 (2.62%); 13. Bulgaria 5,972 (2.47%); 14. Austria 5,644 (2.34%); 15. the GDR 5,375 (2.23%); 16. Israel 4,948 (2.05%); 17. Yugoslavia 4,474 (1.85%); 18. Norway 4,442 (1.84%); 19. Portugal 4,063 (1.68%); 20. Switzerland 4,028 (1.67%); 21. Czechoslovakia 3,783 (1.57%); 22. Hungary 3,652 (1.51%); 23. Luxemburg 3,591 (1.48%); 24. Belgium 3,254 (1.35%); 25. Sweden 2,878 (1.19%); 26. Ireland 2,019 (0.84%); 27. Finland 1,653 (0.68%); 28. Iceland 1,505 (0.62%); 29. Denmark 1,238 (0.51%); 30. the USSR 1,169, including those sent to the GDR (0.48%); 31. Romania 680 (0.28%); 32. Albania 179 (0.07%); 33. Malta 178 (0.07%).

Important observations may be extracted from the study of Table 3.9., which concerns the flow of foreign students and the ratio to the total number of students trained in the countries of the Europe Region.

A first observation concerns the *proportion of national students trained in foreign countries* (including the countries outside the Europe Region) *in the total number of national students* (trained within the country and outside it), as can be seen in column 8 in Table 3.9. Thus, Luxemburg has the highest percentage — 79.99%, followed by Cyprus — 79.10%, Greece — 21.69%, Malta — 13.44%, Israel — 8.66%, Norway — 5.41%; other countries have percentages below 5%. Luxemburg and Cyprus are particularly remarkable from this point of view, training most of their national staff in other countries (nearly 80%).

If we concentrate our attention only on the flow of students from the countries of the Europe Region (column 9 in Table 3.9.), we can observe that the *proportions of national students trained in other countries of this region in the total number of national students* follow a similar trend, but are slightly smaller: Luxemburg — 79.92%; Cyprus 78.98%; Greece — 20.62%; Malta — 10.63%, Israel — 8.60%; Norway — 5.9%, other countries registering percentages below 5%.

Of similar note is the *ratio of the numbers of foreign students trained in the country as compared to those of the national students trained in foreign countries* (column 10 in Table 3.9.). We can observe that from the total of the 27 countries (for which there are available data), 15 countries receive more foreign students than they send to foreign countries to be trained. Thus, the United States of America trains 17.44 times as many foreign students as it sends national stu-

Table 3.9.

The flow of foreign students and their ratio to the total number of students (based on the latest available data)

Country	Number of students trained in the country				Native students trained in foreign countries		$\frac{6}{3+6}\cdot 100$	$\frac{7}{3+6}\cdot 100$	4/6	5/7
	Total	of which:			Total	In the Europe Region countries				
		Native students	Foreign students							
			Total	from Europe Region						
1	2	3	4	5	6	7	8	9	10	11
Albania	12 761	12 668	93	. . .	184	179	1.43	1.39	0.51	. . .
Austria	160 904	145 516	15 388	11 344	5 725	5 644	3.79	3.73	2.69	2.00
Belgium	247 499	222 738	24 761	13 061	3 399	3 254	1.50	1.44	7.61	4.01
Bulgaria	113 795	106 541	7 254	. . .	. . .	5 972	. . .	. . .	1.21	. . .
Canada	1 294 194	1 264 698	29 496	6 426	16 245	15 913	1.27	1.24	1.85	0.40
Cyprus	3 134	2 590	544	. . .	9 801	9 786	79.10	78.98	0.06	. . .
Czechoslovakia	169 344	165 169	4 175	1 252	. . .	3 783	. . .	. . .	. . .	0.33
Denmark	114 559	111 458	3 101	2 741	1 261	1 238	1.12	1.10	2.46	2.21
Finland	92 230	91 251	979	599	1 666	1 653	1.79	1.78	0.59	0.36
France	978 519	846 540	131 979	28 113	12 500	11 863	1.46	1.38	10.60	2.37
German Dem. Rep.	432 672	423 441	9 231	. . .	. . .	5 375	. . .	. . .	. . .	. . .
Germany, Fed. Rep. of	1 550 211	1 470 857	79 354	48 044	22 424	21 927	1.50	1.47	3.54	2.19
Greece	137 453	130 770	6 683	5 289	34 086	33 993	20.68	20.62	0.20	0.16
Hungary	99 344	96 852	2 485	1 263	. . .	3 652	. . .	. . .	. . .	0.35
Iceland	4 035	3 915	120	. . .	1 513	1 505	. . .	. . .	0.08	. . .
Ireland	52 164	49 480	2 684	1 619	2 218	2 019	4.29	3.91	1.21	0.80
Israel	55 486	52 534	2 952	. . .	4 983	4 948	8.66	8.60	0.59	. . .
Italy	1 181 953	1 154 405	27 548	18 510	17 935	14 697	1.53	1.25	1.54	1.26
Luxemburg	982	899	83	. . .	3 594	3 591	79.99	79.92	0.02	. . .
Malta	1 474	1 449	25	. . .	225	178	13.44	10.63	0.11	. . .
Netherlands	317 721	312 016	5 705	4 007	6 406	6 333	2.01	1.99	0.89	0.63
Norway	79 117	77 977	1 140	. . .	4 457	4 442	5.41	5.39	0.26	. . .
Poland	454 190	451 234	2 986	567	. . .	7 441	. . .	. . .	. . .	0.08
Portugal	112 851	110 450	2 401	172	4 187	4 063	3.65	3.54	0.57	0.04
Romania	159 798	149 024	10 774	. . .	. . .	680	. . .	. . .	. . .	. . .
Spain	681 022	670 025	10 997	1 717	9 406	8 718	1.38	1.28	1.17	0.20
Sweden	198 798	185 616	13 182	. . .	2 909	2 878	1.54	1.53	4.53	. . .
Switzerland	110 111	92 715	17 396	13 124	4 132	4 028	2.19	2.14	4.21	3.26
Turkey	417 225	410 493	6 732	1 723	16 168	15 786	3.79	3.70	0.42	0.11
United Kingdom	589 509	540 823	48 686	11 698	14 513	13 340	2.61	2.40	3.35	0.88
United States	12 247 055	11 903 275	343 780	48 780	19 707	16 983	1.65	1.42	17.44	2.87
USSR	5 109 800	5 046 858	62 942	17 880	. . .	1 169	. . .	. . .	. . .	15.30
Yugoslavia	360 397	352 415	7 982	3 110	. . .	4 474	. . .	. . .	1.82	0.70

dents to be trained in foreign countries, France 10.6 times as many, Belgium 7.61, Sweden 4.53, Switzerland 4.21, the FRG 3.53, the United Kingdom 3.35, Austria 2.69, Denmark 2.46; other countries record a much smaller proportion. Moreover, 12 countries train fewer foreign students than they send national students to foreign countries: Luxemburg, Cyprus, Iceland, Malta, Greece, Norway, Finland, Turkey, Albania and Portugal, Israel, the Netherlands.

Regarding the flow between the countries of the Europe Region, the *ratio of the number of foreign students trained in the country* (native to the Region) as compared *to the number of national students received by the other countries of the Region* (column 11 in Table 3.9.), it can be observed that from the total of 22 countries (for which there are available data), 9 countries receive more foreign students than they send national students to the other countries of the Region. Thus, the USSR ranks first, receiving 15.3 times more foreign students than it sends national students to be trained abroad in the Region, followed by Belgium (4.01 times more), Switzerland (3.26), the United States of America (2.87), France (2.37), Denmark (2.21), the FRG (2.19), Austria (twice more); other countries record a lower ratio. Furthermore, 13 countries train fewer foreign students than they send national students to the countries of the Region, as is the case in Portugal, Poland, Turkey, Greece, Czechoslovakia, Finland, Canada and Yugoslavia, Hungary, Ireland, the Netherlands, Spain and the United Kingdom.

4. STATISTICAL DATA ON HIGHER EDUCATION GRADUATES

4.1 Evolution of the number of graduates

Taking the most recent data available into account, we would consider that further to the respective number of graduates in the countries of the Europe Region, a very significant indicator is that of the "number of graduates per 100,000 inhabitants"; it is of social and economic significance, and is perhaps more important than the indicator of the number of students per 100,000 inhabitants, considering the drop-out rates of students, especially in the countries in which there is no previous selection by competitive entrance examination. Examination of the data in Table 4.1. reveals that the number of graduates per 100,000 inhabitants varies very widely : 769 and 56. Under such circumstances, the following categories can be distinguished:

— ***between 500 and 769 graduates per 100,000 inhabitants***, as in Canada and the GDR (with 769 each), the United States of America (765), Belgium (546), and France (500);

— ***between 400 and 499***, as in the United Kingdom (492), Sweden (491), Finland (444) and the Netherlands (421);

— ***between 300 and 399***, as in Ireland (372), Denmark (371), the FRG (370) and the USSR (312);

— ***between 200 and 299***, as in Poland (294), Israel (269), Greece (260), Yugoslavia (254), Hungary (236), Denmark (230), Switzerland (229), Spain (221) and Bulgaria (218);

— ***between 100 and 199***, as in Portugal (176), Romania (172), Italy (159), Cyprus (153), Austria (141), and Albania (122);

— ***less than 100***, as in Turkey (90) and Malta (56).

There are no available data for Iceland, Luxemburg and Norway.

The relative *increase or decrease in the number of students*, between the base and last years, using their average annual rates in view of the different time intervals under consideration, is as follows:

— in 20 countries there are *increasing* average annual rates (in %): the United Kingdom 25.2, Belgium 13.5, Cyprus 9.8, the Netherlands 6.3, Portugal 6.0, the FRG 5.4, Canada 5.0, Switzerland 4.2, the GDR 3.9, Denmark 3.2,

Table 4.1.

The evolution of the number of higher education graduates in the Europe Region countries

Country	Years	Graduates:		Graduates in 100,000 inhabitants:	
		in the base year	in the last year	in the base year	in the last year
Albania	1982; 1985	3 800	3 623	133	122
Austria	1980; 1984	(8921) 9 545*	10 599	(119) 127*	141
Belgium	1980; 1984	(15800) 32 548*	54 006	(160) 330*	546
Bulgaria	1980; 1984	25 756	19 536	291	218
Canada	1980; 1984	159 149	193 432	661	769
Cyprus	1980; 1984	696	1 013	111	153
Czechoslovakia	1980; 1984	31 905	35 615	208	230
Denmark	1980; 1983	17 268	18 999	337	371
Finland	1980; 1985	26 321	21 805	551	444
France	1981; . . .	269 841	. . .	500	. . .
German D.R.	1980; 1984	110 398	128 559	660	769
Germany, F.R	1981; 1983	203 829	226 370	341	370
Greece	1980; 1983	24 649	25 233	256	260
Hungary	1980; 1985	26 863	25 137	251	236
Ireland	1980; 1984	(8885) 14 660*	(7456) 13 272*	(261) 431*	(209) 372*
Israel	1979; 1984	(8978) 12 839*	11 218	(238) 340*	269
Italy	1981; 1983	87 731	90 645	153	159
Malta	1980; 1985	204	216	55	56
Netherlands	1980; 1983	50 326	60 420	356	421
Poland	1980; 1984	117 373	108 309	330	294
Portugal	1980; 1983	(10942) 14 881*	17 732	(111) 151*	176
Romania	1979; . . .	37 834	. . .	172	. . .
Spain	1980; 1984	76 129	84 722	203	221
Sweden	1978; . . .	40 725	. . .	491	. . .
Switzerland	1978; 1985	(8354) 10 944*	(10103) 14 548	(132) 173*	(159) 229*
Turkey	1981; 1983	44 542	42 746	98	90
UnitedKingdom	1980; 1983	140 735	275 725	252	492
United States	1981; 1985	1 797 798	1 830 284	782	765
USSR	1980; 1984	831 200	858 900	313	312
Yugoslavia	1981; 1983	60 092	57 733	267	254

Source: *Unesco Statistical Yearbook* 1983, 1987

Note: The bracketed figures relate only to universities and other equivalent institutions, and those with an asterisk (*) are our estimates on the basis of the ratio of the total number of students to the total number of students enrolled at universities and equivalent institutions.

Austria 2.7, Spain 2.7, Czechoslovakia 2.6, Turkey 2.1, Yugoslavia 2.1, Italy, 1.6, Malta 1.2, Greece 0.8, the USSR 0.8, the United States of America 0.4;

— in 7 countries there are *decreasing* average annual rates (in %): Hungary — 1.3, Albania — 1.6, Ireland — 2.5, Poland — 2.5, Israel — 3.4, Finland — 3.8, Bulgaria — 7.1;

— in 6 countries (France, Iceland, Luxemburg, Norway, Romania and Sweden) no data are available to establish these rates.

Of further significance is the *relative increase or decrease in the number of graduates per 100,000 inhabitants* (also influenced by demographic trends). The corresponding average annual rates (in %) are:

— *increasing* rates in 17 countries: the United Kingdom 25.0, Belgium 13.3, Cyprus 8.3, the Netherlands 5.8, Portugal 5.2, Turkey 4.3 the FRG 4.1, Switzerland 4.1, Canada 3.9, the GDR 3.9, Denmark 3.2, Czechoslovakia 2.5, Yugoslavia 2.5, Spain 2.2, Italy 2.0, Greece 0.5, Malta 0.3.

— *decreasing* rates in 10 countries: the USSR —0.1, the United States of America —0.5, Hungary —1.3, Austria —2.7, Albania —2.9, Poland —2.9, Ireland —3.7, Finland —4.4, Israel —6.0, Bulgaria —7.5.

4.2 Distribution of graduates by ISCED levels

According to the latest available data, the distribution of graduates by ISCED levels is as follows (Table 4.2.):

— In Cyprus, all graduates are included in level 5.

— In 3 countries (Albania, Czechoslovakia and Romania), all graduates are included in level 6.

— 3 countries (Ireland, Israel and Malta) record graduates only at levels 6 and 7.

— For 4 countries (Iceland, Luxemburg, Norway and the USSR), there are no relevant data available.

— In 4 countries (Belgium, Denmark, the Netherlands and Spain), only level 5 is specified separately; level 7 is included in level 6.

From the data supplied by countries which specify the distribution of graduates by levels, one can observe that the largest number is allocated to level 6 (apart from those cases in which data for level 6 include all graduates or also include those of level 7). In 16 countries over 50% of the total of the graduates are to be found at level 6 (in %); Malta 98.15, Austria 93.02, Ireland 88.14, Bulgaria 78.36, Italy 76.53, Turkey 72.43, Israel 72.32, Switzerland 61.40, France 60.94, Greece 60.22, Canada 58.65, the FRG 56.29, Portugal 54.95, the United States of America 53.52, Yugoslavia 53.24, Poland 50.81. 4 other countries register percentages below 50%; the United Kingdom 46.73, Finland 40.90, the GDR 35.30, and Hungary 16.90.

Level 5 (when it has been possible to distribute graduates by levels) registers percentages of over 50% in 5 countries: the Netherlands 74.45, Sweden 59.79, Belgium 57.60, Finland 55.80, Hungary 50.50; and below 50% in 17 countries: Denmark 46.60, Portugal 44.87, the United Kingdom 42.05, Spain 41.54, Yugoslavia 41.47, the GDR 38.58, Greece 38.08, the FRG 37.47, Poland 34.95, Canada 31.69, the United States of America 24.94, Turkey 20.87, Bulgaria 19.93, France 19.08, Switzerland 9.52, Italy 5.59 and Austria 0.60.

Level 7 records large percentages in 5 countries: Hungary 32.60, Switzerland 29.08, Israel 27.68; the GDR 26.12, the United States of America 21.54; and smaller ones in 16 countries: France 19.98, Italy 17.88, Poland 14.24, Ireland 11.86, the United Kingdom 11.22, Canada 9.66, Turkey 6.70, Austria 6.38, the FRG 6.24, Yugoslavia 5.29, Finland 3.30, Sweden 2.18, Malta 1.85, Bulgaria 1.71, Greece 1.70, and Portugal 0.18.

In cases where there are available data for both the base and the last years, one can observe the following *trends* in the evolution of the level structures of the graduates:

— an increase in level 5 in the last year as compared to the base year, in 15 countries: Austria (from 0.32% to 0.60%), Canada (28.76; 31.69), Denmark

Table 4.2.

Distribution of higher education graduates by ISCED levels

(%)

Country	Losses in the base year				Losses in the last year			
	Year	Level Categories			Year	Level Categories		
		5	6	7		5	6	7
Albania	1982	—	100.00	—	1985	—	100.00	—
Austria	1980	0.32	85.57	14.11	1984	0.60	93.02	6.38
Belgium	...	...	...	...	1984	57.60	42.40	./.
Bulgaria	1980	28.64	70.52	0.83	1984	19.93	78.36	1.71
Canada	1980	28.76	61.31	9.93	1984	31.69	58.65	9.66
Cyprus	1980	100.00	—	—	1984	100.00	—	—
Czechoslovakia	1980	—	100.00	—	1984	—	100.00	—
Denmark	1980	40.60	59.40	./.	1983	46.60	55.40	./.
Finland	1980	59.40	38.28	2.32	1985	55.80	40.90	3.30
France	1981	19.08	60.94	19.98	...	...	...	...
German D.R.	1980	35.16	39.44	25.40	1984	38.58	35.30	26.12
Germany, F.R.	1981	36.78	56.86	6.36	1983	37.47	56.29	6.24
Greece	1980	37.23	60.51	2.56	1983	38.08	60.22	1.70
Hungary	1980	48.30	15.93	35.77	1985	50.50	16.90	32.60
Ireland	1980	5.69	66.12	28.19	1984	—	88.14	11.86
Israel	1979	—	71.85	28.15	1984	—	72.32	27.68
Italy	1981	6.10	80.37	13.53	1983	5.59	76.53	17.88
Malta	1980	37.25	53.43	9.32	1985	—	98.15	1.85
Netherlands	1980	69.86	8.13	22.01	1983	75.45	24.55	./.
Poland	1980	33.92	11.76	54.32	1984	34.95	50.81	14.24
Portugal	1980	—	100.00	—	1983	44.87	54.95	0.18
Romania	1979	—	100.00	—	...	...	...	...
Spain	1980	38.74	61.26	./.	1984	41.54	58.46	./.
Sweden	1978	59.79	38.03	2.18	...	...	...	...
Switzerland	1978	4.69	70.89	24.42	1985	9.52	61.40	29.08
Turkey	1981	8.76	87.85	3.39	1983	20.87	72.43	6.70
United Kingdom	1980	16.22	65.30	18.48	1983	42.05	46.73	11.22
United States	1981	24.30	47.71	22.39	1985	24.94	53.52	21.54
Yugoslavia	1981	40.91	51.19	4.90	1983	41.47	53.24	5.29

Sources: Computed from Unesco Statistical Yearbook 1983, 1985, 1986, 1987
Note: ./. inclusion of level 7 data into level 6 data.

(40.60; 46.60), the GDR (35.16; 38.58); the FRG (36.78; 37.47), Greece (37.23; 38.08), Hungary (48.30; 50.50), the Netherlands (69.86; 75.45), Poland (33.92; 34.95), Spain (38.74; 41.54), Switzerland (4.69; 9.52), Turkey (8.76; 20.87); the United Kingdom (16.22; 42.05), the United States of America (24.30; 24.94), Yugoslavia (40.91; 41.47);

— a decrease in level 5, over the same time interval, in 3 countries: Bulgaria (from 28.64% to 19.93%), Finland (59.40; 55.80) and Italy (6.10; 5.59);

— the appearance of level 5, holding a share of 44,87% in Portugal, in the last year, following no observation in the base year, and the disappearance of level 5 in Malta (after recording a base year percentage of 37.25%) and in Ireland (with a base year percentage of 5.69);

— an increase in level 6 in 8 countries: Austria (from 85.57% to 93.02%), Bulgaria (70.52; 78,36), Finland (38.28; 40.90), Hungary (15.93; 16.90), Israel (71.85; 72.32), Poland (11.76; 50.81), the United States of America (47.71;

53.52), and Yugoslavia (51.19; 53.24), not taking into account those countries in which changes in the structure have taken place and where level 6 also includes level 7;

— a decrease in level 6 in 9 countries: Canada (from 61.31% to 58.65%), Denmark (59.40; 55.40), the GDR (39.44; 35.30), the FRG (56.86; 56.29), Greece (60.51; 60.22), Italy (80.37; 76.53), Switzerland (70.89; 61.40), Turkey (87.65; 72.43), the United Kingdom (65.30; 46.73);

— an increase in level 7 in 7 countries: Bulgaria (from 0.83% to 1,71%), Finland (2.32; 3.30), the GDR (25.40; 26.12), Italy (13.53; 17.88), Switzerland (24.42; 29.08), Turkey (3.39; 6.70), Yugoslavia (4.90, 5.29);

— a decrease in level 7 in 8 countries: Austria (from 14.11% to 6.38%), Canada (9.93; 9.66), the FRG (6.36; 6.24); Greece (2.56; 1.70), Hungary (35.77; 32.60), Poland (54.32; 14.24); the United Kingdom (18.48; 11.22), the United States of America (22.39; 21.54).

4.3 Distribution of graduates by fields of study

From the analysis of the *proportion of graduates in each field of study in the total number of graduates in each country*, based on the latest available data, we may infer the priorities attached to these fields. To this end, we have only considered the data which do not add several fields together in order to obtain the percentage for each field in the total number of students. The percentages by field of study are given in decreasing order below:

— *Education science and teacher training* — Hungary 40.45, Portugal 39.41, the Netherlands 31.25, Sweden 28.99, Spain 28.53, Denmark 27.99, Turkey 24.33, Bulgaria 23.85, Belgium 20.81, Poland 20.21, Czechoslovakia 16.89, the FRG 12.69, Yugoslavia 12.53, Greece 12.36, Canada 12.05, Albania 12.17, the GDR 11.38, the United States of America 9.79, Malta 9.72, Cyprus 8.79, Finland 8.16, the United Kingdom 7.78, France 5.37, Switzerland 5.02, Ireland 3.62, Italy 3.01, Austria 1.98.

— *Humanities, religion and theology* — Ireland 30.19, France 22.65, Switzerland 16.63, Austria 13.73, Greece 11.67, Italy 11.56, Spain 11.30, Portugal 11.14, Bulgaria 9.43, the United Kingdom 8.75, Denmark 7.53, Belgium 6.95, Turkey 6.77, Canada 6.18, Finland 5.69, Yugoslavia 5.62, Poland 4.53, the United States of America 4.48, Albania 4.39, the Netherlands 3.77, Hungary 2.71, the FRG 2.59, the GDR 1.98, Malta 1.85, Czechoslovakia 1.18.

— *Fine and applied arts* — Austria 7.29, the Netherlands 4.28, Canada 3.72, the United States of America 3.34, Bulgaria 3.33, the United Kingdom 3.19, Romania 2.52, Albania 2.18, Denmark 1.97, Italy 1.65, the FRG 1.60, Turkey 1.46, Czechoslovakia 1.44, Finland 1.43, Poland 1.32, Yugoslavia 1.15, Belgium 1.09, Hungary 1.05, France 1.00, Greece 0.95, Portugal 0.86, the GDR 0.77, Spain 0.77, Switzerland 0.76, Ireland 0.63.

— *Law* — Austria 20.40, Malta 18.15, Switzerland 13.64, France 13.57, Yugoslavia 10.94, Italy 9.29, Greece 7.88, Spain 7.39, Hungary 5.39, Romania 4.94, Portugal 4.91, Israel 4.50, Czechoslovakia 4.44, Ireland 4.27, the Netherlands 3.89, Turkey 3.86, Belgium 3.78, the FRG 3.10, the United Kingdom 2.88. Finland 2.49, the United States of America 2.33, Albania 2.07, Denmark 2.07. Poland 1.84, Canada 1.75, Bulgaria 1.50, the GDR 0.81.

— *Social and behavioural science* — Yugoslavia 22.92, Switzerland 16.90, the Netherlands 14.18, Canada 13.46, the FRG 12.17, Albania 11.98, Italy 8.98, the United States of America 8.93, Spain 8.62, the United Kingdom 7.40, Greece 7.03, Belgium 6.91, France 6.63, Portugal 6.49, Turkey 5.93, Ireland 5.73, Austria 4.63, the GDR 3.92, Finland 3.52, Denmark 3.22, Hungary 2.21, Poland 1.46, Bulgaria 1.31, Czechoslovakia 1.05.

— *Commercial and business administration* — Cyprus 33.66, the United States of America 23,16, Malta 23.15, Poland 19.83, Belgium 18.32, Canada 18.12, the United Kingdom 15.18, Czechoslovakia 14.33, Greece 14.19, Turkey 13.44, Ireland 12.11, Bulgaria 11.89, Austria 11.36, France 8.73, Finland 7.62, Hungary 7.55, the GDR 7.10, Denmark 5.58, the Netherlands 4.50, Portugal 4.37, the FRG 3.21, Spain 3.18, Yugoslavia 2.73, Italy 1.02.

— *Mass communication and documentation* — the United States of America 2.98, Denmark 2.19, the Netherlands 2.18, Canada 1.92, Spain 1.47, Turkey 1.32, France 0.79, Ireland 0.62, Czechoslovakia 0.61, the GDR 0.55, Poland 0.51, Portugal 0.46, Bulgaria 0.31, the FRG 0.29, Austria 0.27, Belgium 0.19, Switzerland 0.18, Finland 0.16, Yugoslavia 0.07.

— *Home economics (domestic science)* — the United States of America 1.52, Canada 0.46, Ireland 0.44, Finland 0.42, France 0.38, the Netherlands 0.37, the FRG 0.35, Yugoslavia 0.17, Greece 0.16, Portugal 0.10, Turkey 0.10, Poland 0.07, Austria 0.01.

— *Service trades* — Cyprus 13.33, Greece 1.59, Yugoslavia 1.58, Bulgaria 1.40, Spain 1.29, Turkey 0.91, Hungary 0.89, the GDR 0.77, Denmark 0.65, Canada 0.40, the Netherlands 0.38, Finland 0.29.

— *Natural science* — France 13.71, Switzerland 12.83, Israel 9,50, the United Kingdom 8.82, Italy 6.61, Albania 5.96, Spain 5.73, Greece 5.58, Austria 4.91, Romania 4.62, the United States of America 4.55, Finland 4.25, Canada 3.72, the FRG 3.72, Poland 3.00, Turkey 2.94, Bulgaria 2.67, the Netherlands 2.25, Portugal 2.01, Czechoslovakia 1.52, the GDR 1.38, Denmark 1.10, Hungary 0.87l

— *Mathematics and computer science* — Israel 6.69, Finland 6.37, Canada 5.68, Greece 5.35, Cyprus 5.33, the United States of America 4.30, Austria 3.79, Bulgaria 3.33, Italy 2.91, the United Kingdom 2.72, Romania 2.08, Switzerland 2.02 Turkey 1.32, the FRG 1.28, Czechoslovakia 1.24, Hungary 1.23, Spain 1.21, Portugal 1.06, France 0.97, Denmark 0.74, the GDR 0.74, Poland 0.70, the Netherlands 0.29.

— *Medical science and health-related sciences* — Italy 34.97, Malta 31.02, Finland 27.83, the FRG 26.04, Denmark 21.24, the United Kingdom 20.70, Switzerland 19.90, Belgium 17.94, Austria 17.42, Spain 16.92, Poland 15.40, Portugal 14.61, the GDR 14.59, Greece 11.31, the Netherlands 12.15, Bulgaria 10.73, Turkey 10.67, Canada 9.98, the United States of America 9.97, France 9.90, Hungary 9.82, Romania 9.11, Yugoslavia 9.01, Ireland 7.97, Israel 7.33, Czechoslovakia 6.76, Cyprus 6.22, Albania 3.92.

— *Engineering* — Romania 43.53, Czechoslovakia 36.26, Finland 25.68, Bulgaria 24.04, Turkey 21.13, Albania 20.07, Yugoslavia 19.08, the United Kingdom 15.68, Cyprus, 14.81, the GDR 14.67, Poland 14.35, Greece 14.25, Ireland 14.20, Canada 10.69, Denmark 9.60, the FRG 9.38, Portugal 8.16, Hungary 8.02, Malta 7.87, Austria 7.66, Belgium 7.37, Spain 7.17, Switzerland 7.05, Italy 6.78, France 5.56, the United States of America 5.53.

— *Architecture and town planning* — Malta 7.87, Italy 4.74, Hungary 4.58, the United Kingdom 2.26, Turkey 2.23, Spain 2.22, Austria 2.02, the FRG 1.82, Switzerland 1.67, Denmark 1.55, Yugoslavia 1.15, Canada 1.09, Portugal 1.05, Ireland 0.86, the United States of America 0.77, France 0.76, Romania 0.74, Czechoslovakia 0.63, Greece 0.57, Finland 0.44, Poland 0.43, the GDR 0.22, Bulgaria 0.07.

— *Trade, craft and industrial programmes* — the GDR 12.99, Cyprus 8.59, Hungary 7.45, France 6.23, the United States of America 4.58, Poland 4.54, Belgium 4.11, Denmark 3.13, Turkey 0.49, Yugoslavia 0.49, Greece 0.27, Portugal 0.02.

— *Transport and communications* — Yugoslavia 3.39, Greece 2.70, Czechoslovakia 2.69, Denmark 2.00, Bulgaria 1.58, Cyprus 1.58, Hungary 1.48, the GDR 1.11, the Netherlands 0.95, Poland 0.67, the United Kingdom 0.37, Finland 0.22, France 0.20, Canada 0.17, Belgium 0.06.

— *Agriculture, forestry and fishery* — Albania 34.72, Czechoslovakia 10.66, the USSR 9.71, Poland 8.85, Romania 8.18, Hungary 5.47, Yugoslavia 4.47, Bulgaria 4.37, Greece. 3.82, Israel 3.56, Italy 3.51, Ireland 3.50, Switzerland 3.41, the Netherlands 3.30, Austria 3.22, Turkey 3.10, Finland 3.09, Canada 2.70, Denmark 2.39, Cyprus 2.17, the FRG 2.09, Belgium 2.07, the United States of America 1.63, France 1.25, the GDR 1.21, Portugal 1.14, the United Kingdom 1.03, Spain 0.84.

— *Other and not specified* — the GDR 21.92, the FRG 19.67, the United States of America 12.15, Canada 7.92, Denmark 7.55, Cyprus 5.53, Portugal 4.20, Italy 3.85, the Netherlands 3.53, Spain 3.36, Albania 2.54, the United Kingdom 2.47, Finland 2.35, France 2.31, Poland 2.27, Yugoslavia 1.34, Austria 1.31, Hungary 0.83, Belgium 0.48, Czechoslovakia 0.30.

4.4 Proportion of female graduates

According to the latest available data — i.e. those of the last year given for each country in Table 4.1. — the proportion of the female graduates *in the total of graduates*, in %, can be grouped as follows:

— *over 50%*, in 12 countries: Portugal 68.64, Poland, 61.01, Bulgaria 58.03, Hungary 57.26, the GDR 54.65, Denmark 54.37, Spain 53.85, Canada 52.47, Finland 51.27, the United States of America 50.75, Belgium 50.45, Cyprus 50.05.

— *between 40 and 50%*, in 10 countries: Israel 48.52, the Netherlands 48.31, the FRG 46.61, Greece 46.09, the United Kingdom 45.46, Yugoslavia 45.36, Czechoslovakia 45.16, Albania 44.88, France 44.05, Italy 43.02, Ireland 42.58;

— *below 40%*, in 4 countries: Austria 36.77, Turkey 31.93, Switzerland 31.64, Malta 22.69.

There are no available data for 6 countries: Iceland, Luxemburg, Norway, Romania, Sweden and the USSR.

The analysis of the evolution of these percentages over the period under consideration:

— *increased percentages* in the last year as compared to the base year are recorded in 17 countries: Portugal (from 49.94% to 68.64%), Poland (58.94; 61.01), Hungary (55.28; 57.26), Spain (48.22; 53.85), Canada (51.36; 52.47), the United States of America (50.21; 50.75), Belgium (39.93; 50.45); Cyprus

(39.37; 50.05), Israel (44.81; 48.52), the Netherlands (45.92; 48.31), the FRG (45.43, 46.61), Greece (41.81; 46.09), Yugoslavia (43.89; 45.36), Czechoslovakia (41.82; 45.16), Austria (33.74; 36.77), Turkey (27.79; 31.93), Switzerland (24.62; 31.64).

— *decreased percentages*, in 8 countries: Bulgaria (from 61.49% to 58.03%), the GDR (57.94; 54.65), Denmark (54.48; 54.37), Finland (51.36; 51.27), Albania (51.32; 44.88), Italy (43.21; 43.02), Ireland (45.77; 42.58), Malta (24.02; 22.69).

There are no available data for the base year for France and the United Kingdom.

With regard to the proportion of female graduates *by levels of higher education*, considering the latest available data, one can observe the following:

— Cyprus only records graduates at level 5; Albania and Czechoslovakia only at level 6; Ireland and Malta only records graduates at levels 6 and 7.

— For those countries recording graduates at all 3 levels (5, 6 and 7) of higher education, *at level 5* the proportions of the total number of female graduates in each country are as follows, in decreasing order (%): the Netherlands 84.43, Belgium 66.27, Portugal 59.19, Denmark 55.44, Finland 55.44, Hungary 54.63, the FRG 50.20, the United Kingdom 50.04, Spain 48.01, Poland 44.99, Yugoslavia 44.73, Greece 41.28, Canada 33.24, the GDR 20.09, the United States of America 27.26, Bulgaria 22.29, Turkey 22.07, Switzerland 16.11, Italy 7.42, Austria 1.36. *At level 6* (excluding those countries where the level-6 data also include the level-7 data) they are as follows: Austria 94.77, Italy 79.67, Bulgaria 72.51, Turkey 71.66, Switzerland 63.28, Canada 59.18, Greece 57.82, the United States of America 53.50, Yugoslavia 52.05, Spain 51.99, the GDR 49.01, the FRG 46.70, Poland 45.42, Finland 42.82, the United Kingdom 42.52, Portugal 40.70, Hungary 21.37. *Level 7* generally registers smaller percentages: Hungary 24.00, the GDR 21.90, Switzerland 20.61, the United States of America 19.24, Italy 12.91, Poland 9.59, Canada 7.48, the United Kingdom 7.44, Turkey 6.27, Austria 3.87, Yugoslavia 3.22, the FRG 3.10, Finland 1.74, Bulgaria 1.20, Greece 0.90, Portugal 0.11. *Levels 6 and 7*, taken together for those countries where data are combined for both levels, have the following percentages: Spain 51.99, Denmark 44.56, Belgium 33.73, the Netherlands 15.57.

— For the countries where the graduates are recorded only at levels 6 and 7, the percentages *at level 6* are as follows: Malta 100.00, Ireland 91.21, Israel 73.07; and *at level 7:* Israel 26.93, Ireland 8.79.

An analysis of the proportion of female graduates *in the total number of graduates in each field of study* (not taking into account the data which combine several fields of study), based on the latest available data, reveals the following (in %):

— *Education science and teacher training* — Portugal 91.51, Poland, 87.29, Cyprus 81.15, Italy 79.38, the GDR 78.15, Czechoslovakia 78.11, Hungary 77.73, Bulgaria 76.80, Finland 75.83, the United States of America 73.32, Canada 73.20, Denmark 72.51, Spain 71.95, the Netherlands 68.83, Ireland 68.52, Yugoslavia 66.93, Belgium 62.29, the FRG 61.22, Greece 61.14, the United Kingdom 60.03, France 57.55, Malta 52.38, Austria 51.43, Switzerland 50.10, Albania 41.95, Turkey 41.47.

— *Humanities, religion and theology* — Denmark 79.09, Italy 78.92, Portugal 74.85, Bulgaria 74.32, Albania 71.70, France 66.61, Finland 70.56, Greece

69.92, Poland 69.32, Yugoslavia 64.28, Spain 62.19, Hungary 61.97, the United Kingdom 61.27, Canada 60.62, Austria 60.41, Ireland 60.02, Belgium 58.62, the United States of America 53.57, the GDR 53.22, Switzerland 51.96, Czechoslovakia 50.48, the FRG 50.20, the Netherlands 47.83, Turkey 25.37.

— *Fine and applied arts* — Finland 72.76, Greece 63.75, Canada 63.31, Denmark 60.16, Portugal 60.13, Italy 59.88, Switzerland 57.14, the United Kingdom 56.22, the United States of America 56.03, the FRG 52.58, Bulgaria 51.38, Belgium 51.02, Austria 50.71, Czechoslovakia 50.68, Spain 50.15, the Netherlands 48.82, Yugoslavia 48.57, Poland 48.49, the GDR 47.59, Turkey 46.96, France 45.53, Hungary 43.94, Ireland 42.55, Albania 39.24.

— *Law* — Greece 59.73, Hungary 57.96, Yugoslavia 52.91, Bulgaria 51.54, Czechoslovakia 50.98, Poland 49.77, Denmark 47.46, Canada 45.08, the United Kingdom 44.49, Albania 42.67, Spain 42.53, Finland 42.46, Italy 41.49, Ireland 40.88, the United States of America 40.63, Belgium 40.27, Portugal 39,20, the GDR 38.61, Israel 38.42, the Netherlands 32.96, the FRG 31.89, Austria 30.99, Turkey 28.16, Switzerland 25.18, Malta 25.00.

— *Social and behavioural science* — Albania 71.89, the GDR 69.47, Finland 61.54, Czechoslovakia 60.70, Canada 57.30, Poland 56.06, Portugal 54.56, Yugoslavia 52.37, Belgium 52.21, the United States of America 51.13, the Netherlands 50.57, the United Kingdom 49.31, Hungary 48.77, Ireland 48.71, Bulgaria 47.06, Spain 47.79, Greece 43.94, Austria 41.75, the FRG 40.80, Italy 39.14, Turkey 37.11, Denmark 36.60, Switzerland 32.40.

— *Commercial and business administration* — Cyprus 74.19, the GDR 72.53, Hungary 68.79, Poland 66.09, Czechoslovakia 60.71, Finland 58.10, Bulgaria 56.33, Canada 51.34, Belgium 50.57, the United States of America 48.85, Greece 48.07, the FRG 39.74, Spain 37.02, Portugal 35.87, Austria 31.15, the United Kingdom 30.66, Yugoslavia 30.16, Ireland 29.01, Turkey 28.62, Italy 25.03, the Netherlands 20.73, Denmark 18.02, Malta 10.00.

— *Mass communication and documentation* — Italy 100.00, Poland 82.01, the GDR 75.64, Portugal 74. 39, the Netherlands 71.45, the FRG 67.74, Ireland 67.39, Finland 61.71, Denmark 64.75, Czechoslovkia 64.68, Bulgaria 63.93, Canada 60.25, the United States of America 59.05, Belgium 58.00, Austria 51.72, Greece 50.63, Turkey 44.23, Spain 42.17, Yugoslavia 41.86, Switzerland 38.89.

— *Home economics (domestic science)* — Austria 100.00, Greece 100.00, France 99.90, Finland 98.91, Canada 96.04, Poland 93.15, the United States of America 85.65, the FRG 83.61, the Netherlands 76.92, Turkey 76.19, Yugoslavia 72.92, Portugal 72.22, Ireland 21.21.

— *Service trades* — Denmark 86.18, Spain 74.82, the GDR 70.15, Bulgaria 68.13, Finland 60.32, Hungary 56.05, Greece 55.22, Canada 52.76, the Netherlands 48.68, Cyprus 41.48, Yugoslavia 39.28, Turkey 25.58.

— *Natural science* — Portugal 67.42, Bulgaria 62.57, Poland 60.90, Italy 60.76, Israel 51.87, Czechoslovakia 51.20, Finland 50.65, Turkey 47.33, Spain 47.04, the GDR 38.87, the United States of America 38.35, Canada 35.92, Austria 33.46, France 33.45, the United Kingdom 31.94, Hungary 30.28, Greece 28.98. Denmark 26.79, the FRG 23.05, Switzerland 21.99, the Netherlands 19.93.

— *Mathematics and computer science* — Portugal 77.13, Poland 66.89, Italy 661.61, the GDR 47.17, Bulgaria 46.70, Cyprus 44,44, Hungary 43.87, Turkey 43.26, Spain 43.25, the United States of America 39.44, Israel 37.07, Canada 36.54, Czechoslovakia 32.73, Finland 32.69, Austria 30.85, Greece 30.50, the United Kingdom 28.51, Denmark 20.00, the FRG 19.00, Switzerland 17.16, the Netherlands 12.07.

— *Medical science and health-related sciences* — the GDR 88.87, Finland 85.81, Denmark 82.73, the United Kingdom 81.57, Poland 81.52, Cyprus 79.37, Canada 78.06, the United States of America 75.79, Hungary 75,62, the FRG 70.11, Portugal 66.83, Belgium 61.05, Yugoslavia 60.73, the Netherlands 59.38, Spain 59.20, Czechoslovakia 57.65, Bulgaria 56.46, Greece 55.08, Albania 50.70, Israel 46.35, France 44.27, Austria 40.85, Turkey 37.44, Ireland 36.87, Italy 34.26, Switzerland 32.54, Malta 28.36.

— *Engineering* — Bulgaria 40.52, Albania 31.36, the GDR 29.39, Czechoslovakia 24.20, Cyprus 24.00, Belgium 21.95, Poland 21.69, Yugoslavia 18.42, Portugal 18.04, Malta 17.65, Greece 16.63, Turkey 16.14, Hungary 14.78, France 13.68, the United States of America 13.47, Ireland 11.24, the Netherlands 9.47, Finland 9.14, Canada 8.91, Spain 7.84, Denmark 7.24, Austria 4.93, Italy 4.78, the FRG 4.32, Switzerland 3.09.

— *Architecture and town planning* — Greece 59.31, Bulgaria 53.85, Poland 50.65, Yugoslavia 48.27, Turkey 47.27, Finland 43.16, the United States of America 40.00, the GDR 39.93, the FRG 34.61, Portugal 34.41, Czechoslovakia 33.63, Italy 31.71, Denmark 29.49, the United Kingdom 28.16, Switzerland 27.81, Ireland 25.00, Belgium 22.86, Canada 21.64, Hungary 21.11, Austria, 16.82, Spain 13.42, Malta 5.88

— *Trade craft and industrial programmes* — Greece 49.25, Turkey 37.20, Yugoslavia 33.22, Portugal 25.00, the GDR 22.34, Poland 21.44, Hungary 15.81, Belgium 9.59, Denmark 9.26, the United States of America 8.40, Cyprus 8.05.

— *Transport and communications* — Bulgaria 37.01, the GDR 33.50, Belgium 28.13, Cyprus 25.00, Czechoslovakia 24.35, Hungary 22.52, Yugoslavia 12.88, Canada 10.37, Poland 7.59, the United Kingdom 4.01, Greece 3.81, the Netherlands 3.14, Finland 2.13, Denmark 0.53.

— *Agriculture forestry and fishery* — the GDR 49.29, Bulgaria 48.36, Poland 45.67, Greece 39.94, Portugal 37.93, Israel 37.34, Czechoslovakia 36.04, Albania 34.78, the United Kingdom 32.29, Finland 31.75, Canada 31.01, the FRG 30.41, Hungary 30.20, the United States of America 30.13, Spain 30.00, Yugoslavia 26,39, Turkey 26.00, Italy 22.88, Switzerland 22.03, Austria 21.11, Belgium 20.30, Denmark 20.22, the Netherlands 17.75, Ireland 17.62.

— *Other and not specified* — Canada 59.30, the Netherlands 56.41, the United States of America 53.54, France 53.50, Italy 52.84, the GDR 50.93, Portugal 48.99, Spain 48.51, the United Kingdom 47.79, Poland 44.56, the FRG 40.41, Austria 37.41, Albania 34.78, Yugoslavia 31.06, Denmark 29.15, Hungary 28.23, Czechoslovakia 24.53, Finland 21.64, Belgium 17.83, Cyprus 5.26.

5. HIGHER EDUCATION TEACHING STAFF AND STUDENT/TEACHER RATIO

Supplying the necessary number of teaching staff in higher education is a particularly important problem which, to a great extent, may affect the quality of the educational process. With this in mind, the following statistics supply data on the number of teaching staff and the student/teacher ratio. Based on these statistics, we have compiled Table 5.1. below. These data should however, be considered with caution, given that they are deficient in many areas, rendering any conclusions less relevant.

Thus, as regards the method of computing the number of teaching staff, important differences emerge from one country to another, e.g. a) in some cases, only full-time teachers, as opposed to part-time ones, are considered, and in other cases (which, in fact, is the most correct method), the number of part-time teaching staff is converted into the full-time equivalent (by use of conversion coefficients), which is then added to the number of full-time staff; b) in some countries, there is a distinction, both quantitative and qualitative, between the activities assigned to the teaching staff who work in universities and equivalent institutions and the activities of the teaching staff who work in other higher education establishments, which influences the respective proportions in the total number of teaching staff to a great extent; c) in some countries, activity appertaining to part-time higher education is assigned to particular teaching staff who are specially concerned with such activities, and are separate from the teaching staff who work in full-time education, whereas in other countries the same teachers are assigned to all categories of students, with differentiated application from one country to another, depending on the structure of full-time education therein (with a larger or smaller amount of faculty-oriented activity and teacher contact); d) there are differences in the nature of assignments given to the teaching staff, depending on their distribution by the three levels of higher education, which makes the proportion of each level in the total number of students bear an influence on the total number of teaching staff required for higher education: e) also, in some countries, the teaching staff may be assigned to purely scientific research tasks, on a quota basis or for a limited time, whereas in other countries there may be

Table 5.1.

Higher education teaching staff and student/teacher ratios

Country	Years	Higher education teaching staff		Student/teacher ratios		Teachers in 100,000 inhabitants in the last year
		Number in the base year	Number in the last year	Number in the base year	Number in the last year	
Albania	1980; 1985	1 103 (20)	1 468 (24)	13	15	50
Austria (1) (3)	1980; 1985	12 572 (13)	10 252 (18)	10	...	137
Bulgaria	1980; 1985	14 412 (39)	15 252 (37)	7	7	170
Canada	1980; 1985	53 434 (24)	57 443 (24)	17	23	226
Cyprus	1980; 1985	227 (25)	343 (31)	9	9	52
Czechoslovakia	1980; 1985	22 478 (26)	23 944 (28)	9	7	154
Denmark	1981; 1985	5 535	5 929	13	15	116
Finland (1)	1980; 1985	6 194	7 169	14	13	146
France (1)	1982; 1985	43 075 (25)	45 461 (25)	21	22	82
German Dem.Rep.	1980; 1985	38 699 (27)	42 336	10	10	254
Germany, Fed. Rep. of	1980; 1984	171 708	182 310	7	8	298
Greece	1980; 1983	10 542 (32)	12 067 (34)	11	12	123
Hungary	1980; 1985	13 890 (29)	14 850 (30)	7	7	139
Ireland	1981; 1984	5 572	5 761	11	12	161
Italy	1982; 1984	48 787	49 997	22	24	86
Luxemburg	1980; 1983	250	318	3	3	86
Malta	1980; 1985	129 (5)	156 (6)	7	9	41
Netherlands (4)	1981; 1985	11 146	11 751	...	...	81
Norway	1980; 1984	7 763 (19)	8 648 (26)	10	11	208
Poland (1)	1980; 1985	57 083 (35)	57 280 (35)	8	6	154
Portugal	1980; 1984	10 695 (31)	11 272 (35)	9	10	111
Romania	1980; 1985	14 592 (30)	12 961 (29)	13	12	57
Spain	1980; 1984	42 831 (21)	47 539 (25)	16	17	124
Switzerland (1)	1980; 1985	5 942 (8)	6 236	10	12	98
Turkey	1980; 1984	21 577 (25)	21 949	11	19	46
United Kingdom	1981; 1984	63 000	79 544	14	13	141
United States (2)	1980; 1985	395 992 (26)	694 000	...	18	290
USSR	1980; 1985	365 300	377 300	14	14	136
Yugoslavia	1980; 1984	24 449 (24)	26 110 (26)	17	14	114

Source: *Unesco Statisical Yearbook* 1987; *Higher Education in the Netherlands*, CEPES, Bucharest, 1985 p. 64; *CRE Information* No. 77/1987, pp. 35, 37.

Notes: The bracketed figures show the percentage proportion of the female teaching staff
(1) Data refer to universities and equivalent degree-conferring institutions only
(2) In 1980, data on teaching staff refer to full-time teachers only
(3) From 1982, data refer to full-time teachers only
(4) Number of teachers in full-time equivalents for higher vocational education

no such assignment, a situation which again influences the necessary number of teaching staff.

Futhermore, the student/teacher ratio is influenced by the proportion of part-time students in the total number of students, in the sense that in those countries where part-time education is strongly developed (especially by correspondence or distance-learning), a teacher may teach a larger number of students, on average, but this does not imply a proportionately larger educational effort on his part.

Moreover, the data for some countries only relate to universities and equivalent institutions, whereas for most countries they relate to the entire higher education structure.

Consequently, the student/teacher ratio, which should be of major significance, loses its significance in practice, when international comparisons are drawn thus, it is only advisable to consider those groups of countries with similar higher education structures and where comparable regulations are applied with regard to the assignments of the teaching staff, which, in turn, affect the number of teaching positions necessary.

Bearing in mind the details and qualifications mentioned above, the analysis of the data in Table 5.1. reveals some aspects which may serve as a guide. Thus, the data on the ***number of teaching staff in higher education per 100,000 inhabitants*** (using the last year's data) give the following:

— *over 200*, in 5 countries: the FRG 298, the United States of America 290, the GDR 254, Canada 226, Norway 208;

— *between 100 and 200*, in 14 countries: Bulgaria 170, Ireland 161, Czechoslovakia 154, Poland 154, Finland 146, the United Kingdom 141, Hungary 139, Austria 137, the USSR 136, Spain 124, Greece 123, Denmark 116, Yugoslavia 114, Portugal 111;

— *below 100*, in 10 countries: Switzerland 98, Italy 86, Luxemburg 86, France 82, the Netherlands 81, Romania 57, Cyprus 52, Albania 50, Turkey 46, Malta 41.

The student/teacher ratio, according to the latest available data, appears as follows: Luxemburg 3, Poland 6, Bulgaria 7, Czechoslovakia 7, Hungary 7, the FRG 8, Cyprus 9, Malta 9, Austria 10, the GDR 10, Portugal 10, Norway 11, Greece 12, Ireland 12, Romania 12, Switzerland 12, Finland 13, the United Kingdom 13, the USSR 14, Yugoslavia 14, Albania 15, Denmark 15, Spain 17, the United States of America 18, Turkey 19, France 22, Canada 23, Italy 24. Furthermore, in 6 countries the student/teacher ratio *decreases* (when comparing the base-year data with the last-year data): Czechoslovakia (from 9 to 7), Finland (14; 13), Poland (8; 6), Romania (13; 12), the United Kingdom (14; 13), Yugoslavia (17; 14); it is *stable* in 6 other countries: Bulgaria (7; 7), Cyprus (9; 9), the GDR (10; 10), Hungary (7; 7), Luxemburg (3, 3), the USSR (14; 14); and it *increases* in 14 countries: Albania (13; 15), Canada (17; 23), Denmark (13; 15), France (21; 22), the FRG (7; 8), Greece (11; 12), Ireland (11; 12), Italy (22; 24), Malta (7; 9), Norway (10; 11), Portugal (9; 10), Spain (16; 17), Switzerland (10; 12), Turkey (11; 19).

Given the available data, one can observe that the *proportion of the female teachers in higher education*, presented in their decreasing order in %, is as follows: Bulgaria 37, Poland 35, Portugal 35, Greece 34, Cyprus 31, Hungary 30, Romania 29, Czechoslovakia 28, the GDR 27, Norway 26, the United States of America 26, Yugoslavia 26, France 25, Spain 25, Turkey 25, Albania 24, Canada 24, Austria 18, Switzerland 8, Malta 6.

6. EXPENDITURE ON HIGHER EDUCATION

It is practically impossible to compile complete statistics concerning the total public and private expenditure on higher education for several countries of the world. Accordingly, it is generally considered that only the statistics on public expenditure in the higher education sector are of relevance. Moreover, a comparative analysis of the data at current prices and in relative national currencies of the countries under consideration is virtually meaningless, for obvious reasons. Therefore, recourse is made to relative values (proportions), which can provide conclusive results.

From the analysis in Table 6.1., we can primarily observe the total public expenditure on education (expressed as a % of the Gross National Product (GNP), as well as the current expenditure expressed as a % of the total expenditure and as a % of the GNP and the capital expenditure (expressed similarly to the current expenditure).

According to the most recent data available, the *total public expenditure on education as a % of the GNP* varies relatively widely over the countries under consideration: the percentages allocated to education may be grouped as follows:

— *over 7%*, in 5 countries: Israel 8.5, Sweden 7.7, Canada 7.2, Bulgaria 7.0, Hungary 7.0;

— *between 5 and 7%*, in 14 countries: the Netherlands 6.9., the United States of America 6.8, Ireland 6.7, Norway 6.7, Denmark, 6.6, the USSR 6.6, Belgium 6.1, Austria 5.8, France 5.8, Italy 5.7, Luxemburg 5.6, Finland 5.5 the United Kingdom 5.2, Czechoslovakia 5.1;

— *between 3 and 5%*, in 7 countries: Switzerland 4.9, the FRG 4.6, Portugal 4.2, Cyprus 3.9, Yugoslavia 3.6, Malta 3.4, Spain 3.3;

— *below 3%*, in 3 countries: Greece 2.4, Turkey 2.3, Romania 2.1.

The relative increases and decreases in the total public expenditure on education (as a % of the GNP), between the base year and the last year, are as follows:

a) *countries with increasing percentages:* Austria (from 5.6% in the base year to 5.8% in the last year), Belgium (6.0; 6.1), Bulgaria (5.6; 7.0), Cyprus (3.5; 3.9), Czechoslovakia (4.8; 5.1), France (5.1; 5.8), Greece (2.2; 2.4), Hun-

Table 6.1.

Public expenditure on education

Country	Years	Total public expenditure on education as % of GNP	Current expenditure		Capital expenditure	
			As % of the total	As % of GNP	As % of the total	As % of GNP
Austria	1980; 1985	5.6; 5.8	85.3; 90.1	4.8; 5.2	14.7; 9.9	0.8; 0.6
Belgium	1980; 1985	6.0; 6.1	98.9; 94.9	5.9; 5.8	1.1; 5.1	0.1; 0.3
Bulgaria	1980; 1985	5.6; 7.0	95.9; 89.6	5.4; 6.3	4.1; 10.4	0.2; 0.7
Canada	1980; 1985	7.5; 7.2	92.5; 93.1	6.9; 6.7	7.5; 6.9	0.6; 0.5
Cyprus	1980; 1985	3.5; 3.9	94.0; 95.4	3.3; 3.7	6.0; 4.6	0.2; 0.2
Czechoslovakia	1980; 1985	4.8; 5.1	94.1; 95.6	4.5; 4.9	5.9; 4.4	0.3; 0.2
Denmark	1980; 1984	6.9; 6.6	88.7 ...	6.1 ...	11.3 ...	0.8 ...
Finland	1980; 1984	5.5; 5.5	91.7; 93.5	5.1; 5.1	8.3; 6.5	0.4; 0.4
France	1980; 1982	5.1; 5.8	92.5; 93.5	4.7; 5.4	7.5; 6.5	0.4; 0.4
German Dem. Rep.	1980; 1985	... ...	... ...	5.3 5.4	... ...	... ...
Germany, Fed. Rep. of	1980; 1984	4.7; 4.6	86.4; 90.2	4.1; 4.2	13.6; 9.8	0.6; 0.4
Greece	1979; 1983	2.2; 2.4	94.3; 96.4	2.0; 2.3	5.7; 3.6	0.2; 0.1
Hungary	1980; 1985	4.7; 7.0	83.1; 91.5	3.9; 6.4	16.9; 8.5	0.8; 0.6
Ireland	1980; 1984	6.6: 6.7	86.6; 91.4	5.7; 6.1	13.4; 8.6	0.9; 0.6
Israel	1980; 1983	8.4; 8.5	92.3; 90.9	7.7; 7.7	7.7; 9.1	0.7; 0.8
Italy	1979; 1983	5.0; 5.7	86.5; 92.8	4.4; 5.2	13.6; 7.2	0.6; 0.5
Luxemburg	1980; 1983	6.0; 5.6	95.0; 93.9	5.7; 5.3	5.0; 6.1	0.3; 0.3
Malta	1980; 1985	3.0; 3.4	99.3; 98.2	3.0; 3.3	0.7; 1.8	0.0; 0.1
Netherlands	1980; 1984	7.9; 6.9	86.7; 88.3	6.9; 6.1	13.3; 11.7	1.0; 0.8
Norway	1980; 1985	7.2; 6.7	83.4; 88.3	6.0; 5.9	16.6; 11.7	0.8; 0.8
Poland	1980; 1985	... ...	... ...	4.0; 4.7	... ...	... ...
Portugal	1980; 1983	4.4; 4.2	85.4; 94.6	3.8; 4.0	14.6; 5.4	0.6; 0.2
Romania	1980; 1984	3.3; 2.1	88.8; 96.8	2.9; 2.1	11.2; 3.2	0.4; 0.0
Spain	1980; 1985	2.3; 3.3	... ...	... ...	... ...	... ...
Sweden	1980; 1985	9.1; 7.7	86.4; 88.8	7.8; 6.9	13.6; 11.2	0.9; 0.8
Switzerland	1980; 1985	5.0; 4.9	89.5; 91.0	4.5; 4.4	10.5; 9.0	0.5; 0.5
Turkey	1980; 1985	2.7; 2.3	83.7; 83.4	2.2; 2.0	16.3; 16.6	0.5; 0.3
United Kingdom	1980; 1984	5.6; 5.2	94.1; 96.0	5.3; 5.0	5.9; 4.0	0.3; 0.2
United States	1980; 1983	7.0; 6.8	... ...	... ...	... ...	... ...
USSR	1980; 1983	7.1; 6.6	85.1; 85.3	6.1; 5.6	14.9; 14.7	1.0; 1.0
Yugoslavia	1980; 1985	4.7; 3.6	85.1; 93.2	4.0; 3.4	14.9; 6.8	0.7; 0.2

Source: *Unesco Statistical Yearbook* 1983, 1987.

Notes: Cyprus — Expenditure by the Office of Greek Education only;
Belgium — Expenditure of the Ministry of Education only;
Bulgaria, Czechoslovakia, the German Dem. Rep., Poland, the USSR — Expenditure on education is calculated as a percentage of net material product;
0.0 — value less than 0.1.

gary (4.7; 7.0), Ireland (6.6; 6.7), Israel (8.4; 8.5), Italy (5.0; 5.7), Malta (3.0; 3.4), Spain (2.3; 3.3);

b) *countries with decreasing percentages:* Canada (from 7.5% in the base year to 7.2% in the last year), Denmark (6.9; 6.6), the FRG (4.7; 4.6), Luxemburg (6.0; 5.6), the Netherlands (7.9; 6.9), Norway (7.2; 6.7), Portugal (4.4; 4.2), Romania (3.3; 2.1), Sweden (9.1; 7.7), Switzerland (5.0; 4.9), Turkey (2.7; 2.3), the United Kingdom (5.6; 5.2), the United States of America (7.0; 6.8), the USSR (7.1; 6.6), Yugoslavia (4.7; 3.6).

c) *countries with stable percentages:* Finland (5.5).

Data recently published by Unesco concerning *public expenditure per student in US dollars* are presented below in Table 6.2. for the years 1975 and 1985. The data present an interesting picture of the situation, although any comparisons must be made cautiously, due to the fluctuations in the value of hard currency and in the exchange rates of national currencies in comparison with the US dollar.

Table 6.2.

Public expenditure per student in US dollars

Countries	1975	1985	Countries	1975	1985
Austria	1607	3129	Italy	814	1894(1)
Belgium	2077	2772	Luxemburg	2598	4942(1)
Bulgaria	559	1137	Malta	290	563
Canada	2151	4096	Netherlands	2365	2910
Cyprus	291	902	Norway	2553	4462
Czechoslovakia	695	962	Poland	371	394
Denmark	3025	3390	Portugal	340	459(1)
Finland	1788	2989	Romania	194	237
France	1692	2912(1)	Spain	249	630
German Dem. Rep.	961	1697	Sweden	3735	5317
Germany, Fed. Rep. of	1935	3021	Switzerland	2901	5274
Greece	247	462(1)	Turkey	. . .	120
Hungary	287	768	United Kingdom	1337	2152
Iceland	920	. . .	United States	1757	4220(1)
Ireland	706	1349	USSR	749	1056
Israel	1110	2157(1)	Yugoslavia	401	374

Source: *World Education at a Glance* — 1987, Office of Statistics of Unesco, p. 18.
Note: (1) Data refer to 1983.

The *proportion of current expenditure in the total public expenditure on education*, according to the latest available data, is as follows (in %):

— in 20 countries, it is *over 90%:* Malta 98.2, Romania 96.8, Greece 96.4, the United Kingdom 96.0, Czechoslovakia 95.6, Cyprus 95.4, Belgium 94.9, Portugal 94.6, Luxemburg 93.9, Finland 93.5, France 93.5, Yugoslavia 93.2, Canada 93.1, Italy 92.8, Hungary 91.5, Ireland 91.4, Switzerland 91.0, Israel 90.9, the FRG 90.2, Austria 90.1;

— in 6 countries, it is *below 90%:* Bulgaria 89.6, Sweden 88.8, the Netherlands 88.3, Norway 88.3, the USSR 85.3, Turkey 83.4.

Consequently, the proportion ranges between 83.4% and 98.2%. The smaller it is, the greater is the allocation for investment over the given period in that country.

An analysis of the *proportion of capital expenditure in the total public expenditure on education*, based on the latest available data, reveals the following groups (in %):

— *over 10%*, in 6 countries: Turkey 16.6, the USSR 14.7, the Netherlands 11.7, Norway 11.7, Sweden 11.2, Bulgaria 10.4;

— *between 5 and 10%*, in 14 countries: Austria 9.9, the FRG 9.8, Israel 9.1, Switzerland 9.0, Ireland 8.6, Hungary 8.5, Italy 7.2, Canada 6.9, Yugoslavia 6.8, Finland 6.5, France 6.5, Luxemburg 6.1, Portugal 5.4, Belgium 5.1;

— *below 5%*, in 6 countries: Cyprus 4.6, Czechoslovakia 4.4, the United Kingdom 4.0, Greece 3.6, Romania 3.2, Malta 1.8.

The proportion of public current expenditure on education in the GNP is influenced by the amount allocated to this expenditure in the total public expenditure on education and by the proportion of public expenditure on education in the GNP. An analysis of the latest available data presents the following categories:

— *above 5%* in 16 countries: Israel 7.7, Sweden 6.9, Canada 6.7, Hungary 6.4, Bulgaria 6.3, Ireland 6.1, the Netherlands 6.1, Norway 5.9, Belgium 5.8, the USSR 5.6, France 5.4, the GDR 5.4, Luxemburg 5.3, Austria 5.2, Italy 5.2, Finland 5.1;

— *between 4 and 5%*, in 6 countries: the United Kingdom 5.0, Czechoslovakia 4.9, Poland 4.7, Switzerland 4.4, the FRG 4.2, Portugal 4.0;

— *below 4%*, in 6 countries: Cyprus 3.7, Yugoslavia 3.4, Malta 3.3, Greece 2.3, Romania 2.1, Turkey 2.0.

The *proportion of public capital expenditure on education in the GNP* varies as follows:

— *over 0.5%*, in 9 countries: the USSR 1.0, Israel 0.8, the Netherlands 0.8, Norway 0.8, Sweden 0.8, Bulgaria 0.7, Austria 0.6, Hungary 0.6, Ireland 0.6;

— *0.5%* and below, in 17 countries: Canada 0.5, Italy 0.5, Switzerland 0.5, Finland 0.4, France 0.4, the FRG 0.4, Belgium 0.3, Luxemburg 0.3, Turkey 0.3, Cyprus 0.2, Czechoslovakia 0.2, Portugal 0.2, the United Kingdom 0.2, Yugoslavia 0.2, Greece 0.1, Malta 0.1, Romania below 0.1.

Data are only available on public current expenditure and not on the capital expenditure on higher education. The public current expenditure on higher education is analysed (Table 6.3.) as % of the total public current expenditure on education and also as a % of the GNP. Given the data available, the distribution of the current expenditure on higher education by area is as follows (in %):

The *public current expenditure on higher education*, expressed as a % of the total public current expenditure on education, using the latest available data, is as follows (Table 6.3.):

— *over 15%*, in 17 countries: the United States of America 38.3, Canada 28.7, the Netherlands 26.6, Turkey 23.9, Israel 22.5, the GDR 21.8, the United Kingdom 21.4, Hungary 20.5, the FRG 19.4, Greece 19.3, Switzerland 18.6, Poland 18.2, Finland 18.0, Belgium 16.7, Ireland 16.5, Austria 16.2, Yugoslavia 15.3;

— *between 10 and 15%*, in 6 countries: Czechoslovakia 14.7, Norway 13.5, the USSR 13.3, Sweden 13.1, France 12.6, Bulgaria 12.4;

— *below 10%*, in 3 countries: Malta 8.2, Cyprus 4.2, Luxemburg 2.5.

An analysis of the relative increases and decreases in these percentages between the base year and the last year results in the emergence of the following trends:

— *increases*, in 11 countries: Austria (from 14.5% in the base year to 16.2% in the last year), (Canada 27.4; 28.7), Cyprus (4.1; 4.2), France (12.5; 12.6), the GDR (20.5; 21.8), the FRG (15.1; 19.4), Italy (9.1; 10.1), Luxemburg

Table 6.3.

Public current expenditure on higher education

Country	Years	Total public current expenditure on higher education		Distribution of the current expenditure on higher education by area (in %)				
		As % of the total public current expenditure on education	As % of G.N.P.	Teachers' emoluments	Teaching materials	Scholarships	Welfare services	Other current expenditure
Austria	1980; 1984	14.5; 16.2	0.70; 0.84	32.9; 33.5	— ; —	6.3; 5.3	10.7; 9.3	50.1; 51.9
Belgium	1980; 1985	17.3; 16.7	1.02; 0.97	. . . ; 52.0	. . . ; —	. . . ; —	. . . ; 2.7	. . . ; 45.3
Bulgaria	1980; 1985	13.6; 12.4	0.73; 0.78	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .
Canada	1980; 1985	27.4; 28.7	1.89; 1.92	40.6; 38.9	19.2; 13.6	9.3; 10.5	1.5; 3.7	29.4; 33.3
Cyprus	1980; 1985	4.1; 4.2	0.14; 0.16	51.9; 58.2	0.5; 1.9	20.6; 11.9	4.7; 5·7	22.3; 22.3
Czechoslovakia	1980; 1985	16.1; 14.7	0.72; 0.72	41.5; 39.3	19.1; 19.7	11.3; 10.1	14.3; 16.8	13.8; 14.1
Denmark	1980; . . .	17.6; . . .	1.07; . . .	49.2; . . .	3.2; . . .	2.9; . . .	4.1; . . .	40.6; . . .
Finland	1980; 1984	18.9; 18.0	0.96; 0.92	51.0; 52.2	2.8; 1.9	18.5; 16.3	3.6; 5.7	24.1; 23.9
France	1980; 1982	12.5; 12.6	0.59; 0.68	97.9; 71.4	— ; —	0.9; 3.9	— ; 5.0	1.2; 19.7
German Dem. Rep.	1980; 1985	20.5; 21.8	1.09; 1.18	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .
Germany, Fed. Rep. of	1980; 1984	15.1; 19.4	0.62; 0.81	. . . ; 74.1	. . . ; —	. . . ; 2.6	. . . ; 0.5	. . . ; 22.8
Greece	1980; 1983	21.0; 19.3	0.42; 0.44	. . . ; 62.8	. . . ; —	. . . ; 0.3	. . . ; 4.9	. . . ; 32.0
Hungary	1980; 1985	20.8; 20.5	0.81; 1.31	. . . ; . . .	. . . ; . . .	15.5; 13.9	46.8; 48.2	37.7; 37.9
Ireland	1980; 1984	17.6; 16.5	1.00; 1.01	42.5; 52.0	— ; —	5.5; 10.1	— ; —	52.0; 37.9
Israel	1980; 1983	24.8; 22.5	1.91; 1.73	. . . ; 12.2	. . . ; 2.0	. . . ; 2.2	. . . ; —	. . . ; 83.6
Italy	1979; 1983	9.1; 10.1	0.40; 0.53	. . . ; 32.4	. . . ; —	. . . ; 2.9	. . . ; —	. . . ; 64.7
Luxemburg	1980; 1983	1.5; 2.5	0.09; 0.13	46.0; 34.3	3.2; 3.3	35.7; 47.0	— ; —	15.1; 15.4
Malta	1980; 1985	9.3; 8.2	0.28; 0.27	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .
Netherlands	1980; 1984	27.5; 26.6	1.90; 1.62	65.5; . . .	0.3; 3.1	5.5; 8.7	1.2; 1.3	27.5; 86.9
Norway	1980; 1985	13.6; 13.5	0.82; 0.80	56.9; . . .	22.0; 25.9	. . . ; 0.3	— ; —	21.1; 73.8
Poland	1980; 1985	23.6; 18.2	0.94; 0.86	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .
Portugal	1980; 1983	10.5; 11.7	0.40; 0.47	75.2; 68.1	— ; 0.0	6.5; —	8.6; 11.6	9.7; 20.3
Sweden	1980; 1985	9.3; 13.1	0.73; 0.90	60.3; 34.3	— ; —	— ; —	— ; 1.5	39.7; 64.2
Switzerland	1980; 1984	18.6; 18.6	0.84; 0.82	. . . ; 45.0	. . . ; 4.9	. . . ; 4.3	— ; —	. . . ; 45.8
Turkey	1980; 1985	28.3; 23.9	0.62; 0.48	84.9; . . .	— ; —	— ; —	3.4; 8.7	11.7; 91.3
United Kingdom	1980; 1984	22.4; 21.4	1.19; 1.07	. . . ; 28.2	. . . ; 5.3	. . . ; 31.6	. . . ; 0.6	. . . ; 34.9
United States	1979; 1982	36.0; 38.3	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .
USSR	1980; 1985	13.8; 13.3	0.84; 0.74	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .
Yugoslavia	1980; 1985	18.5; 15.3	0.74; 0.52	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .	. . . ; . . .

Source: *Unesco Statistical Yearbook* 1983, 1987.

Notes: Bulgaria, Czechoslovakia, German Dem. Rep., Poland, the USSR — total public current expenditure on higher education is calculated as a percentage of net material product.

(1.5; 2.5), Portugal (10.5; 11.7), Sweden (9.3; 13.1), the United States of America (36.0; 38. 3);

— *decreases*, in 16 countries: Belgium (from 17.3% in the base year to 16.7% in the last year), Bulgaria (13.6; 12.4), Czechoslovakia (16.1; 14.7), Finland (18.9; 18.0), Greece (21.0; 19.3), Hungary (20.8; 20.5), Ireland (17.6; 16.5); Israel (24.8; 22.5), Malta (9.3; 8.2), the Netherlands (27.5; 25.6), Norway (13.6; 13.5), Poland (23.6; 18.2), Turkey (28.3; 23.9), the United Kingdom (22.4; 21.4), the USSR (13.8; 13.3), Yugoslavia (18.5; 15.3);

— *no change*, in Switzerland (18.6).

Public current expenditure on higher education as a % of the GNP based on the latest data available, can be divided into two groups, with percentages:

a) *above 1%*, 8 countries: Canada 1.92, Israel 1.73, the Netherlands 1.62, Hungary 1.31, the GDR 1.18, Denmark 1.07, the United Kingdom 1.07 Ireland 1.01;

b) *below 1%*, 20 countries: Belgium 0.97, Finland 0.92, Sweden 0.90, Poland 0.86, Austria 0.84, Switzerland 0.82, the FRG 0.81, Norway 0.80, Bulgaria 0.78, the USSR 0.74, Czechoslovakia 0.72, France 0.68, Italy 0.53, Yugoslavia 0.52, Turkey 0.48, Portugal 0.47, Greece 0.44, Malta 0.27, Cyprus 0.16, Luxemburg 0.13.

Regarding the evolution of these percentages, 3 groups of countries can be distinguished, namely countries with:

a) *increasing percentages:* Austria (from 0.70% to 0.84%), Bulgaria (0.73; 0.78), Canada (1.89; 1.92), Cyprus (014; 0.16), France (0.59; 0.68), the GDR (1.09); 1.18), the FRG (0.62; 0.81), Greece (0.42; 0.44), Hungary (0.81; 1.31), Ireland (1.00; 1.01), Italy (0.40; 0.53), Luxemburg (0.09; 0.13), Portugal (0.40; 0.47), Sweden (0.73; 0.90);

b) *decreasing percentages:* Belgium (from 1.02% to 0.97%), Finland (0.96; 0.92), Israel (1.91; 1.73), Malta (0.28; 0.27), the Netherlands (1.90; 1.62), Norway (0.82; 0.80), Poland (0.94; 0.86), Switzerland (0.84; 0.82), Turkey (0.62; 0.48), the United Kingdom (1.19; 1.07), the USSR (0.84; 0.74), Yugoslavia (0.74; 0.52);

c) *stable percentages:* Czechoslovakia (0.72).

It is also important to establish the *distribution of the current expenditure on higher education by area* (in %). The area receiving the greatest amount is that of *teachers' emoluments*. From the latest available data, we observe that the proportion of this expenditure in the total current expenditure is:

a) *over 50%*, in 8 countries: the FRG 74.1, France 71.4, Portugal 68.1, Greece 62.8, Cyprus 58.2, Finland 52.2, Belgium 52.0, Ireland 52.0;

b) *below 50%*, in 9 countries: Switzerland 45.0, Czechoslovakia 39.3, Canada 38.9, Luxemburg 34.3, Sweden 34.3, Austria 33.5, Italy 32.4, the United Kingdom 28.2, Israel 12.2.

Another important category is that of *current expenditure on teaching materials;* however, data regarding this area are more scarce. Thus, on the basis of the latest data available, the proportion of expenditure in this area is increasing (in %): in Norway (25.9), Czechoslovakia (19.7), Canada (13.6), the United Kingdom (5.3), Switzerland (4.9), Luxemburg (3.3), the Netherlands (3.1), Israel (2.0), Cyprus (1.9), Finland (1.9). There are no data available for the other countries.

The *expenditure on scholarships* is as follows: Luxemburg 47.0, the United Kingdom 31.6, Finland 16.3, Hungary 13.9, Cyprus 11.9, Canada 10.5, Czechoslovakia 10.1, Ireland 10.1, the Netherlands 8.7, Austria 5.3, Switzerland 4.3, France 3.9, Italy 2.9, the FRG 2.6, Israel 2.2, Greece 0.3, Norway 0.3.

The *expenditure on welfare services* in the total current expenditure appears as follows: Hungary 48.2, Czechoslovakia 16.8, Portugal 11.6, Austria 9.3, Turkey 8.7, Cyprus 5.7, Finland 5.7, France 5.0, Greece 4.9, Canada 3.7, Belgium 2.7, Sweden 1.5, the Netherlands 1.3, the United Kingdom 0.6, the FRG 0.5.

Regarding *other current expenditure*, there are large differences from country to country as to what is included therein, depending on the distribution over the other categories of current expenditure. Comparisons in this respect are of relatively little significance.

REFERENCES

Application of ISCED to Programmes of Education at the Third Level in Countries of the Europe Region. Paris, Unesco, Office of Statistics, 1986.

Classification internationale type de l'éducation. Vol. 1 et 2. Paris, Unesco, 1981.

Development of Education in Europe: A Statistical Review. Fourth Conference of Ministers of Education of Member States of the Europe Region, Unesco, Paris, 21–27 September, 1988.

L'Enseignement en Belgique. Bruxelles, INBEL.

Enseignement supérieur en Europe. Bucarest, CEPES, Vol XI, No. 3, 1986.

Enseignement supérieur en Tchécoslovaquie. Praha, Státní Pedagogické Nakladatelství, 1983.

European University Systems. Part I: CRE-INFORMATION, No. 75/1986, Part II: CRE-INFORMATION, No. 77/1986.

Guide de la classification internationale type de l'éducation. Paris, Unesco, 1976.

Higher Education and Economic Development in Europe, 1975–1980. Vol. I and II. Bucharest, CEPES, 1983.

Higher Education in Europe. Bucharest, CEPES. Vol. XIII, No. 3, 1988.

Higher Education in the Netherlands. Bucharest, CEPES, 1985.

Higher Education in the Netherlands. Characteristics, structure, figures, facts. Zoetermeer, the Netherlands, May 1988.

International Standard Classification of Education. Vol. 1 and 2. Paris, Unesco, 1976.

Open Doors: 1986/1987 – Report on International Educational Exchange. New York, Institute of International Education, 1987.

Statistics of Students from Abroad in the United Kingdom 1985/6. London, 1988.

Unesco Statistical Digest 1987. Paris, Unesco Office of Statistics.

Unesco Statistical Yearbook: 1983 through 1987. Paris, Unesco.

U.R.S.S. '88 – Annuaire. Moscou, Agence de presse Novosti, 1988.

World Education at a Glance 1987. Paris, Unesco, Office of Statistics.

Part II

Research and Experimental Development in the Europe Region: 1980—1985

7. RESEARCH AND EXPERIMENTAL DEVELOPMENT (R & D) IN THE CONTEXT OF HIGHER EDUCATION

7.1 Aims of a Statistical Study on R & D

The previous statistical studies published by CEPES in 1976, 1978 and 1983 covered various aspects of higher education which have also been dealt with in Part I of the present volume.

It is obvious, however, that no picture of higher education is complete unless it includes all the basic functions, i.e. teaching, training and research. The indissoluble link between these functions need not be emphasised. A study on *Higher Education and Research* published by CEPES in 1986 not only argues this case but also gives examples of some existing experiences and practices in uniting teaching and research in higher education. In the light of the findings of the above-mentioned study and following a specific recommendation of the CEPES Advisory Committee, it has been decided for the first time, to introduce, a separate section devoted to the statistical analysis of the *R & D dimension of higher education* in the Centre's series of statistical studies.

Unless higher education institutions are actively engaged in research, they cannot continue to impart to their students the high level of knowledge that is required of them and soon become dependent on external centres of research. In other words, without research, institutions of higher education cannot properly perform their other basic functions, i.e. teaching and training. Among other things, they cannot assure that they recruit adequately qualified teaching and research staff. Furthermore, the research component of higher education is equally important in that it facilitates access to the world stock of knowledge for each nation and allows them to participate actively in the international research effort.

The link between higher education and research does not, however, imply that the universities exercise a monopoly on scientific research. On the contrary, the existence of research centres outside the higher education system is not only useful but also necessary in today's conditions of scientific and tehnical progress.

Rich and long traditions, geographic distribution of institutions, flexibility and adaptability to ever-changing operating conditions have continued to uphold R & D as the most diverse sector within the present higher educational structure. While emphasising its research function, one must not overlook the fact that higher education owes its existence primarily to teaching. Even those higher education institutions which may boast the most eminent researchers among the members of their teaching staff cannot exist without the presence of the students and the constant preoccupation for training highly qualified specialists.

The present study is based on the statistical data relating to research and experimental development which are collected and published each year by Unesco. It is, in many ways, a pioneer in the field. Consequently, as the first attempt of its kind, it can only offer a highly tentative approximation of R & D activity in the countries of the Europe Region, with specific reference to the research carried on within higher education. Anyone who is familiar with the organisational complexity of research, both in terms of units, structures and individuals involved and also of the financial and other material resources at its disposal, will recognise the difficulties involved in a statistical evaluation of the scientific research potential of any given country.

Science statistics can be defined as a separate branch of statistics, whose object is the measurement of the volume and structure of scientific activity and technological development in a given country on the basis of conceptual framework. Information is organised in such a way as to permit the measurement, analysis and evaluation of a set of variables which are relevant to the policy of science.

The specific nature of science and technology, the universality of their characters, imply strict interdependence among countries. Therefore, the domain of science stands to gain considerably from solid and valid comparable statistical data.

The elaboration of this part of the study concerning R & D, primarily the formulation of the conclusions and generalisations for the period 1980—1985 as compared to the 1970's, has been beset by certain difficulties which have generated mainly from: the lack of information about most of the countries of the Region after 1984; the difficulty in comparing various data given in national currencies; and the different interpretations of the research fields classified according to the ISCED levels and fields of higher education. Similar discrepancies between the countries can be observed in their interpretation of the sectors of performance and the sources of finances in the different evaluations of the number of personnel employed in R & D, etc.

The statistical calculation of certain indicators which facilitate internatinal comparison has been performed, although some deficiencies in the data (especially the lack of complete information available for the more recent period) could not be avoided. This implies that the general statements and conclusions may only be preparatory in nature.

Lack of more complex and complete information has forced the authors to limit themselves to an analysis of the major inputs to R & D, both human and material. However, before engaging upon the statistical analysis of the human research resources and expenditures on R & D, it is necesary to present the organisation of research activities both inside and outside higher education institutions.

To this end, this part of the study includes remarks and conclusions from the *Comparative Survey of the National Policies Regarding the Organisation, Statute and Management of Research inside and outside Higher Education in the Countries of the Europe Region* which was elaborated at the request of CEPES in 1987 by *K.* Hüfner for West European countries, Canada, Israel and the United States of America, and by S. Kwiatkowski for the East European countries.

7.2 Organisation and management of R & D inside and outside higher education

It should be stressed from the very beginning that it would be impossible to cover the specific organisational details of each national science system of the countries of the Europe Region. Instead of embarking upon the particular details of each national R & D system, another approach would appear to be more useful. In order to facilitate a better understanding of the organisational problems of the national R & D system, a model of three levels as a structural-functional approach or analytical tool has been chosen. It helps to classify the different bodies and institutions engaged in R & D and define their specific functions. Thus, a "national R & D system" may be defined as a set of interrelated organisations and institutions, in which the R & D activities are planned, funded, coordinated, implemented and evaluated.

Generally, three levels may be distinguished:

a) the national level,
b) the sectorial level, and
c) the institutional level.

The national level consists of all bodies which have and/or share responsibilities related to R & D. National agencies responsible for science policy vary greatly. Most of them are not responsible for military R & D, although this may consistently influence the drafting of R & D budgets and the allocation of scientists and engineers.

A major problem is the broad domain of activities encompassed within R & D measures – a continuum too vast to fall within the authority of one single Ministry or National Council. The problem of how to section this continuum into manageable segments has been "solved" by the governments in different ways, mostly by separating science from technology, often resulting in new changes in the administrative structures. The problem of how to establish the "optimum blend" between centralisation and decentralisation remains a major organisational-administrative problem in many countries – changes often occur as a necessary result of the evolution of new problem areas for R & D efforts.

The introduction of planning strategies further complicates the overall structure. The most powerful instrument of co-ordination seems to be the "economic lever" of the science budget, accompanied by new rules regarding funding for the different sectors and institutions at the two other levels. Another instrument, closely connected with future allocation of resources, is the periodic evaluation of the past R & D performance of different institutions in and outside higher education. Many governments have implemented different measures in this respect.

Moving on to the sectorial level, the problem of funding R & D becomes and issue of inter- and intra-sectorial allocation, namely:

1) the allocation of such expenditure between (a) research establishments directly attached to government departments, (b) private, profit-oriented institutions engaged in R & D, and (c) non-profit research institutions in and outside higher education; and

2) the allocation to R & D in the regular budgets included in the national education budgets of higher education institutions.

In addition, the relative importance of "extra-budgetary" financing of R & D in universities must be discussed.

Nearly all governments have developed elaborate policies to encourage R & D undertaken by and aimed at industry, often at the small- and medium-sized companies. The policies adopted, however, vary greatly. The encouragement of industrial R & D happens either through direct subsidies and/or — indirectly — through financial preferences. In the process of promoting industrial R & D activities, the individual companies which operate in competitive market economies are confronted with a number of extra-institutional problems, such as the place of the research department and its link with the management, the coupling of research development and marketing, etc., which deserve further attention. Moreover, the extent to which other research institutes can learn from the organisational experiences of industrial companies should be taken into account.

In many countries, an increasing importance attached to the role of research councils can be observed. In general terms, the role of research councils, which to a certain extent are required to function as intermediaries ("buffer" institutions) between government and research institutions in and outside universities, consists in reconciling the increasingly divergent demands of these "two worlds". Traditionally, the research councils perform three functions, namely (a) advisory function, (b) distribution of funds, and (c) dissemination of information, thereby working "upward" towards the government and "downward" towards the institutions receiving funds. The distribution of funds takes place on the basis of purely scientific criteria: applications from scientists; peer evaluations, which are funded in relation to their scientific value. In the 1970's, the research councils started to fulfil a fourth function by initiating and activating research in new areas, balancing fundamental and applied research as it should be — according to their own criteria. Today, in many countries an even more interventionist policy of the research councils and changing criteria on which funds are allocated may be observed. Research councils started to direct research institutions either to broad research areas or to specific research topics which were identified by the governments or by science policy bodies as being of national priority.

As the importance of R & D for specific national objectives became more clearly recognised, even those institutions engaged in fundamental research were asked to set selective priorities in their research programmes. Although the universities were recognised to be most propitious environment for fundamental research, the governments started to establish new mechanisms or to enlarge the existing ones. This occurred on the one hand due to the slowness and/or unwillingness ("freedom of teaching and research") and/or inability (due to the dramatic expansion during the 1970's in student numbers) of the universities, and on the other to the requirement for specific and expensive equipment (e.g. nuclear research, space research).

The universities are still confronted with the internal problem of providing more flexible structures and enhanced possibilities of mobility in order to allow multi- and inter-disciplinary work. The classical departmental structure and the discipline-oriented recruitment patterns might be necessary for teaching purposes but endanger the future of university research which demand an increasing need for multi-disciplinary team-work beyond the traditional department structures.

There is another problem which appears between the specialisation and the breadth of higher education personnel.

"In the modern world, scientific progress is usually made by very specialised experts who have a thorough knowledge of a particular area of study which they build on in their own research. Research is an activity for specialists. For students up to the level of a first degree, however, the case for a broad education remains powerful. A continuing problem for the university is to find the right balance between specialisation required by its research function and breadth indicated by its teaching function". *

University-industry relations for R & D depend very much upon the R & D as financed and performed by industry itself. In the 1970's, a stagnation of the industrial R & D activities in most of the OECD countries could be observed. This can partly be explained by the general reluctance of risking investments in a climate of economic recession and partly by the lack and/or decline of government expenditure on R & D in support of industrial growth.

In times when industry is becoming increasingly unwilling to invest in R & D, additional pressure is put on the universities to meet more requests for long-term "strategic" research, defined as "research addressed neither to problems of immediate short-term relevance nor to problems which derive their interest solely from scientific theory but having as a background a practical orientation". **

"Universities are a recognised repository of public knowledge. They draw on it in their teaching. They add to it through their research. However, despite the rhetoric in academia about the strong complementarity of research and teaching, the roles of the university as disseminator of public knowledge and creator of new public knowledge are distinct. Academies may be able to teach what new industrial scientists need to know, without having their research be particularly relevant to industry. Basic scientific principles and research techniques may be important, but in many technologies the cutting edge of industrial R & D may stand quite separate from what the academics are doing. On the other hand, in some areas of technology, industrial R & D appears to be very dependent on academic research. . . university research rarely in itself generates new technology; rather it enhances technological opportunities and the productivity of private R & D, in a way that induces firms to spend more, both in the industry in question and upstream". * (i.e. university research enhances indirectly the effectiveness of profit-making R & D).

---

* Williams, G. The Role of Research in Higher Education Institutions: Some Policy Questions, In: *Higher Education and Research*, CEPES, Bucharest, 1986.

** *The Future of University Research*, OECD, Paris, 1981, p. 72.

The universities are confronted with two problems: one vis-à-vis the governments, the other vis-à-vis industry. The governments expect from the universities (and try to influence them through new structures of funding) that they implement parts of a broadly determined national science policy, thus moving away from their ideal of undertaking research of purely scientific interest. The other problem refers to the application and profitability of R & D results. Universities might get the "appetite", and in some cases actually do, for undertaking research of immediate applicability and subsequently "marketing" it themselves, thus competing with private companies. For the time being, most countries do not possess the mechanisms to "balance" the interests of the governments, universities and industry.

Technological progress is brought about by a variety of R & D activities. While such activities are often grouped together as "R & D", there are in fact important differences between "R" and "D". Basic research discoveries are often difficult to appropriate, and frequently are undertaken outside the profit-making sector, hereby including the higher education establishments. On the other hand, development efforts often generate benefits that can be appropriated via intellectual property rights and are undertaken chiefly by for-profit firms. **

7.3 Terms of reference

For statistical purposes, "scientific and technological activities" can be defined as all systematic activities which are closely concerned with the generation, advancement, dissemination and application of scientific and technical knowledge in all fields of science and technology, i.e. the natural sciences, engineering and technology, the medical and the agricultural sciences, as well as the social sciences and humanities.

These activities may be divided into three broad groups:

— Research and experimental development;

— Science and technology education and training mainly at the third level;

— Scientific and technological services.

This study is focussed on the group "Research and experimental development".

Most of the data included in this study were obtained from replies to the annual statistical questionnaires on manpower and expenditure for R & D sent to the Member States of Unesco during recent years, completed or supplemented by data collected in earlier surveys and from official reports and publications.

The database and the Unesco publications are the main sources for the data in this study. Additional information was derived from the above-mentioned studies by Klaus Hüfner and Stefan Kwiatkowski. In some cases, the figures differ between the sources, the reasons behind these differences usually not being indicated. Therefore a priority of sources had to be set: (1) database, (2) most recent Yearbook,(3) Hüfner's and Kwiatkowski's studies.

---

* Nelson, R R. Institutions Supporting Technical Advance in Industry. *The American Economic Review*, Vol. 76, No. 2, May 1986, pp. 187—188.

** Katz, M. L.; Shapiro, C. R, & D Rivalry with Licensing or Imitation. *The American Economic Review*, Vol. 77, No. 3, June 1987, pp. 404—405.

Nevertheless, not all the information necessary for an analysis was available.

In utilising the data in this publication, the reader should bear in mind the factors which have an obvious influence on their comparability and the degree of accuracy.

Science statistics have not reached the same stage of development in all countries. While some countries have established systems of science data collection by means of regular surveys, others are just embarking on systematic and comprehensive enquiries into their R & D activities.

Moreover, national statistical practices and concepts are not necessarily designed for the specific requirements of international comparison. Consequetly, most countries had to rearrange their existing national data and often prepare estimates for the specific purposes of the Unesco enquiries.

As an example of the problem of comparability: the basic concept "Research and Experimental Development" is largely the same in all countries. However, the methods of measurement and the coverage of the data frequently differ, sometimes to an extent which renders international comparisons quite difficult. In most countries, only those activities of research institutes, departments and similar research organisations which could be defined specifically as research or experimental development were included in the survey. In other countries, however, the total volume of activity of such research institutes and similar organisations was included, without making the necessary adjustments to exclude the so-called "related" scientific and technological activities, such as scientific and technological services which are not classified as R & D.

Another example is the subject coverage: in earlier surveys some countries included social sciences in R & D and others omitted this significant segment of R & D, while many European countries also include the humanities, in some cases inseparable from the social sciences, which have been included in the Unesco surveys since 1971.

7.4 Reliability of data

Not all data are available for all countries for the same years and the time series are extremely incomplete. As the last year of reported information may date back many years, data has to be calculated either by interpolation/extrapolation, or the nearest year has to be taken into consideration in order to complete the tables. Another relevant aspect is the fact that the footnotes referring to differences in the definitions of statistics are numerous. A first reason is the difference between countries regarding R & D systems. It is not always possible to fit the national data into the international standardised framework of concepts, definitions and classifications.

Secondly, it is sometimes not possible for countries to attribute values to all things asked for in the questionnaires.

These facts result in the supply of footnotes, which may concern:

— Stock of qualified manpower (ST) versus Economically Active qualified manpower (EA);

— Figures including or excluding data for law, humanities and education;

— Data based on a small sample;

— Certain categories included in other categories;

— Data referring to persons of a certain age and over;

— Data referring to full-time plus part-time instead of full-time equivalents;

— Excluding social sciences and humanities in the productive sector;

— Excluding social sciences and humanities in the general service sector;

— Excluding certain data in the higher education sector;

— Excluding scientists and engineers engaged in the administration of R & D.;

— Regarding military R & D, only the part performed in civil establishments is included;

— Data refer to government activities only;

— Data refer to the higher education sector only;

— Excluding military and defence R & D;

— Methodological changes, etc.

No attempt has been made to collate these explanatory notes. The interested reader may consult the relevant *Unesco Statistical Yearbooks.*

Sometimes the data are estimated, in which case the source is indicated by an asterisk. It is, however, not always clear whether or not the other data are estimated, calculated (e.g. broken down on the basis of earlier established percentages), or — at least — rounded up or down.

Generalising the conclusion of Martin and Irvine, who studied the international comparability of government funding of academic and academically related research in six OECD countries, it is not possible to estimate meanigful numerical margins of error for the various sets of data.

Nevertheless, the very importance of R & D in the socio-economic development of each country and the part played by higher education in carrying out R & D renders this first evaluation of the resources engaged in R & D in the countries of the Europe Region significantly valuable.

8. HUMAN RESOURCES ENGAGED IN R & D

8.1 Number of personnel engaged in R & D

R & D activities require a multifarious range of input including financial resources, equipment, instruments used for measurement and verification, material goods, scientific information and, obviously, qualified personnel. All these elements are dynamically interrelated, but the most valuable component of the entire system is the highly skilled labour force engaged in R & D, which devises new ideas, strategies and technologies, and thus contributes to social progress.

The total number of personnel engaged in R & D (see Table 8.1.) comprises scientists and engineers as well as technicians and auxiliary personnel directly participating in R & D activities in an institute or a unit and who, as a rule are paid for their services. The following three categories of scientific and technical personnel are defined according to the work they are engaged in, and their qualifications:

(a) Scientists and engineers, comprising persons working in such capacities, i.e. as persons with scientific or technological training (usually with completed third level education) in any field of science, who are engaged in professional work in R & D, administrators and other high-level personnel who direct the execution of R & D activities;

b) Technicians, comprising persons engaged in such a capacity in R & D activities who have received vocational or technical training in any branch of knowledge or technology;

(c) Auxiliary personnel, comprising persons whose work is *directly* associated with the performance of R & D activities, i.e. clerical, secretarial and administrative personnel, skilled, semi-skilled and unskilled workers in the various trades and all other auxiliary personnel.

All data concerning the number of personnel and those referring to the number of scientists and engineers engaged in R & D must be interpreted with caution when comparing different countries.

The full-time personnel (FT) comprises those persons who devote all or almost all of their working time to a given scientific and technological activity.

Table 8.1.

Total personnel engaged in R & D; Europe Region: 1970, 1975, 1980, 1985

Country	(ca) 1970	(ca) 1975	(ca) 1980	(ca) 1985
Austria	10734	15392	18599(h)	...
Belgium	25165(a)	30131	...	...
Bulgaria	46633	60939	72335	90308
Canada	*52255	55971(e)	58700	76985
Cyprus	430	...	121	131(j)
Czechoslovakia	137667	149011	171789	180439
Denmark	*12362	13801(d)	15274(g)	19914
Finland	*7724(a)	13450	15990(g)	*23550
France	202869	219700	230800(g)	...
Germany, Fed. Rep. of	270000	303384	363208	373451(i)
German Dem. Rep.	...	158573	189000	198330
Greece	2470(a)	5345(d)	4308(g)	4873(i)
Hungary	50749	60604	62866	48745
Iceland	256	509	614(g)	...
Ireland	3847(a)	5498	6153(g)	6193(j)
Italy	75376	94686	95803	117887
Malta	73(a)	73(d)	46(h)	46
Netherlands	56800	54290	53560	61400
Norway	9909	13170	15005	18781
Poland	196200	299000	240200	181000
Portugal	7165(b)	6721(d)	7711	9267(j)
Romania	46382	157814(d)	204000	...
Spain	16187	25728(d)	30164(g)	34080(j)
Sweden	25038(a)	36382	36434(g)	50203
Switzerland	*18351	27040	37945(g)	...
USSR	3000000	3800000	4400000	...
United Kingdom	258746(c)	259100	261400(f)	...
United States	776000	...	...	...
Yugoslavia	36467	44524	53699	68591

Source: *Unesco Statistical Yearbook*, 1985, 1986, 1987.
Notes: (a): 1969; (b): 1971; (c): 1972; (d): 1976; (e): 1977; (f): 1978; (g): 1979; (h): 1981; (i): 1983; (j): 1984.

The part-time personnel (PT) shows only those persons who devote only part of their working time to a given scientific and technological activity.

Most of the countries of the Europe Region use the full-time equivalent (FTE) as a method of calculation. This is a measurement unit representing one person working full-time for a given period in R & D and is used to convert figures relating to the number of part-time workers (PT) into the equivalent number of full-time workers (FT).

During the period 1970—1985, some countries like Bulgaria and Switzerland have renounced addition of the number of FT and PT workers in favour of the estimation in FTE of the number of R & D workers. Other countries like Austria and Yugoslavia have abandoned the estimation in FTE and are now using the system of addition of the FT and PT workers. There are, finally, some countries like Hungary and Israel which have maintained their system of adding together FT and PT workers.

The comparability of data is also affected by the inclusion, in some countries, of the whole staff of universities and equivalent institutions in the number of scientists and engineers engaged in R & D without distinguishing their research function from those of teaching or administration.

As far as is known, the number of personnel engaged in R & D activities increased during the period 1981—1985, for some countries quickly, for others more slowly. The average annual growth rate varies greatly in the first half of this decade (see Table 8.2.).

According to the average annual growth rate during the period 1981—1985, the countries of the Europe Region can be divided into the following groups:

(a) countries in which a considerable increase of 5 and over 5% is registered annually: Canada (5.6), Finland (6.7), Iceland (9.3), Portugal (5.0), Romania (6.6), Sweden (7.0) and Yugoslavia (5.0).

Table 8.2.

Annual average growth rate of the personnel in R & D

Country	Annual average growth rate			
	(ca) 1971—1980		(ca) 1981—1985	
	Period	%	Period	%
Austria	1971—1981	5.1		. . .
Belgium	1970—1977	2.3		. . .
Bulgaria	1971—1980	4.5	1981—1985	4.5
Canada	1971—1980	1.2	1981—1985	5.6
Cyprus	1971—1980	−11.9	1981—1984	2.0
Czechoslovakia	1971—1980	2.2	1981—1985	1.0
Denmark	1970—1979	2.4	1980—1985	4.5
Finland	1970—1979	7.5	1980—1985	6.7
France	1971—1979	1.4		. . .
Germany, Fed. Rep. of	1971—1980	3.0	1981—1983	0.9
German Dem. Rep.	1976—1980	3.6	1981—1985	1.0
Greece	1970—1979	5.7	1980—1983	3.1
Hungary	1971—1980	2.2	1981—1985	−4.9
Iceland	1971—1979	12.4	1980—1981	9.3
Ireland	1970—1979	4.8	1980—1984	0.2
Italy	1971—1980	2.4	1981—1985	4.2
Malta	1970—1981	−3.8	1982—1985	0.0
Netherlands	1971—1980	−2.2	1981—1984	2.2
Norway	1971—1980	4.4	1981—1985	4.6
Poland	1971—1980	2.0	1981—1985	−5.5
Portugal	1972—1980	0.8	1981—1984	5.0
Romania	1971—1980	6.6	1981—1985	6.6
Spain	1971—1979	7.2	1980—1984	2.5
Sweden	1970—1979	3.8	1980—1985	5.5
Switzerland	1971—1979	8.4		. . .
United Kingdom	1971—1979	0.2		. . .
USSR	1971—1980	2.5(a)	1981—1985	1.9(a)
Yugoslavia	1971—1980	1.6	1981—1985	5.0

Source: Computed from *Unesco Statistical Yearbook*, 1985, 1986, 1987.
Note: (a) Estimates based on the average updated number of employees in science units.

(b) another group of countries characterised by a lower average annual growth rate (below 5%): Bulgaria (4.5), Cyprus (2.0), Czechoslovakia (1.0), Denmark (3.8), France (1.7), the FRG (1.7), the GDR (1.7), Greece (3.1), Ireland (0.2), Italy (4.2), the Netherlands (2.2), Norway (3.5), Spain (2.5) and the USSR (1.9);

(c) in Malta the number of personnel engaged in R & D remained the same; and

(d) there was a decrease in Hungary (−4.9) and Poland (−5.5).

For the other countries of the Europe Region no data are available after 1980.

In order to broaden the statistical insight, the evolution characteristic of the period 1981—1985 is compared below to that characteristic for the 1960—1970 decade. A marked mobility can be seen in the average annual rates, as a result of changes having taken place in the scientific policy of the various countries.

Compared with the 1971—1980 period, after 1980 a decrease was registered in the growth rate of the personnel engaged in R & D. Therefore, compared to the previous decade, in Czechoslovakia, Finland, the FRG, the GDR, Greece, Iceland, Ireland, Spain and the USSR in 1981—1985 there was a less obvious increase noticeable in the personnel engaged in R & D, while in Hungary and Poland, after an average annual growth of 2.2 and 2.0% respectively for the 1971—1980 period, in recent years and important decline of the personnel engaged in R & D is now evident.

In other countries like Bulgaria, Canada, Denmark, Italy, Norway, Portugal, Romania, Sweden and Yugoslavia, the average growth rate has been maintained or has even accelerated. In two countries, Cyprus and the Netherlands, after a tendency to reduce the numbers of personnel engaged in R & D in the period 1971—1980, an average annual growth of 2.0 and 2.2% respectively is noticeable after 1980.

In Malta, the total number of personnel engaged in R & D decreased in 1977—1981, but at present it is maintained at the 1981 level.

In conclusion, a clear growth in the total number of personnel engaged in R & D in the Europe Region for the whole period 1970—1985 has been witnessed with the exception of two countries: Hungary and Poland.

The proportion of personnel engaged in R & D in the economically active population (see Table 8.3.) is for most of the countries of the Europe Region between 0.5 and 1.5%. There are, of course, several countries which surpass the upper limit, such as: Bulgaria, Czechoslovakia, the FRG, the GDR, the USSR, while countries like Cyprus and Spain are found below the lower limit for the above-mentioned period.

Comparing the last year's available data with those characteristic of the years 1975 and 1980 it can be concluded that on the whole, the total number of personnel engaged in R & D has increased more rapidly than the average of each and every country, resulting in a growth of the science sector in the active population in almost all the countries of the Region.

8.2 Scientific and technical manpower potential

The scientific and technical manpower potential gives an indication of all persons in the population with the necessary qualifications to become personnel in the categories "scientists and engineers" and "technicians".

Table 8.3.

Share of personnel engaged in R & D in the economically active population*

Country	1975	1980	(ca) 1985
Austria	0.58	0.66(e)	. . .
Belgium	0.80	. . .	. . .
Bulgaria	1.66	1.80	2.13(g)
Canada	0.58(b)	0.54	0.68(g)
Cyprus	. . .	0.06	0.06(g)
Czechoslovakia	2.11	2.33	2.34
Denmark	0.58(a)	0.63(d)	0.74(f)
Finland	0.58	0.71(d)	0.97
France	1.06	1.09(d)	. . .
Germany, Fed. Rep. of	1.20	1.37	1.52(f)
German Dem. Rep.	2.14	2.44	2.23
Hungary	1.19	1.25	0.99
Iceland	0.52	0.58	. . .
Ireland	0.52	0.54(d)	*0.55
Italy	0.49	0.47	0.55(f)
Netherlands	1.17	1.08	1.18(a)
Norway	0.77	0.78	0.88(g)
Poland	2.57	2.00	1.49(g)
Portugal	0.18(a)	0.19	0.23(g)
Romania	0.76	0.95	1.27
Spain	0.21(a)	0.26(d)	0.33(g)
Sweden	0.87	0.87(d)	1.13(f)
Switzerland	0.94	1.28(d)	. . .
USSR	3.72	3.91	. . .
United Kingdom	1.14	1.15(e)	. . .
Yugoslavia	0.94	0.93	1.03(g)

Notes: (a): 1976; (b): 1977; (c): 1978; (d): 1979; (e): 1981; (f): 1983; (g): 1984.

* Estimates based on data provided by Unesco and ILO in the 45th Issue Yearbook of Labour Statistics, Geneva, 1985.

There is a distinction between the total stock of qualified manpower (ST) and the number of economically active qualified manpower (ES).

The stock of qualified manpower covers all relevant persons regardless of economic activity, age, sex, nationality or other characteristics, present in the domestic territory of a country at a given reference date. The economically active manpower comprises all relevant persons engaged or actively seeking work in some branch of the economy at a given reference date.

The total numerical strength of the most qualified human resources, namely the stock (ST) and the number of economically active persons (EA) who possess the necessary qualification to become scientists, engineers or technicians are essential pieces of information for the planning and formulation of science policy.

Data relating to stock are usually obtained from a population census, so that they are not readily available every year, when the economically active qualified manpower is being calculated. In this study, EA is shown and ST is given as an alternative where possible, when data are lacking (see Statistical Annexes 1 and 2).

Table 8.4. shows a high increase in scientific and technical manpower potential during the period 1970—1980. After 1980 — as far as is known — there has also been an increase, but often at a relatively slower rate.

Table 8.4.

Scientific and technical manpower potential: 1970, 1975, 1980—1985; indices (1980 = 100)

Country	1970	1975	1980	1981	1982	1983	1984	1985
Bulgaria	47	84	100	106	...	109	...	...
Finland	52	66	100	...	109	...	118	...
Germany, Fed. Rep. of	14	33	100	...	...	...	...	...
German Dem. Rep.	...	81	100	103	...	110	113	116
Hungary	38	48	100	...	...	...	144	...
Israel	28	61	100	...	...	...	131	...
Netherlands	26	45	100	107	...	...	...	125
Poland	71	93	100	...	...	...	120	...
San Marino	...	...	100	...	215	203	...	231
USSR	57	80	100	104	108	111	...	117
Yugoslavia	28	49	100	109	...	...	...	...

Source: Computed from *Unesco Statistical Yearbook*, various issues.

For some countries, data are available both for the number of personnel engaged in R & D (Table 8.1.) and for the scientific and technical manpower potential (Table 8.4.). It can be noticed that between 1970 and 1975 the relative growth of the scientific and technical manpower potential was sometimes higher than the growth of the total number of the personnel engaged in R & D (e.g. Bulgaria, the FRG, the Netherlands and Yugoslavia) and sometimes lower (e.g. Finland, Hungary and Poland).

During the period 1976—1980 all countries show a relatively higher increase of the manpower potential. After 1980, this also holds good for most countries (the GDR, Hungary, the Netherlands, Poland and Yugoslavia), but not in the case of Bulgaria and Finland (see Statistical Annex 3).

With specific reference only to the scientific manpower potential, i.e. the number of potential scientists and engineers, excluding the technicians, the Unesco estimates for the Europe Region show an average annual growth rate of 6.8% for 1981—1985, a little lower than the world mean growth rate for the same period (7.0%).

The total growth of the scientific potential of the Europe Region, estimated for the whole period 1981—1985 at 38.7%, actually represents a more rapid growth than was seen in the past decade.

Thus, as far as human resources are concerned, R & D has increasingly favourable prerequisities at its disposal.

Table 8.5.

Unesco estimates for the scientific manpower potential in the Europe Region in 1980 and 1985*

Estimated indicators	1980	1985
1. Number of potential scientists and engineers (thousands)	50911	70616
2. Share in world's scientific manpower potential (%)	64.3	63.8
3. Number per million population	48440	64845

* Calculation based on Unesco estimates provided in the 1987 *Statistical Yearbook.*

8.3 Scientists and engineers engaged in R & D

The estimated number of scientists and engineers engaged in all fields of R & D in the Europe Region grew from about 2.1 million persons in 1970, representing c. 79% of the world total, to 2.9 million persons in 1980. The share in the 1980's world estimate was 77%.

Since 1980, the number of scientists and engineers engaged in R & D (see Table 8.6.) has grown in nearly all the countries, although the annual growth rate (%) varies greatly from country to country.

The following groups of countries can be distinguished:

a) countries in which the increase registered is especially high — over 10%: in Canada (10.1), Israel (18.2), Italy (10.2).

b) countries in which the annual increase can be considered as high — between 5 and 10%: Denmark (5.4), Finland (7.1), Ireland (8.2), the Netherlands (8.2), Portugal (6.8), Sweden (8.0), the United States of America (5.3) and Yugoslavia (5.8):

c) countries in which the increase registered is moderate — below 5%: Austria (3.0), Bulgaria (4.4), Cyprus (3.1), Czechoslovakia (2.7), the FRG (2.3), the GDR (1.6), Norway (4.9), Spain (2.4) and the USSR (1.7);

d) in Turkey the total number of researchers and engineers engaged in R & D activities appears to remain constant at the 1980 level;

e) countries in which a decrease is evident: Greece (−2.8); Hungary (−2.6), Malta (−4.6), the most marked decrease being registered in Poland (−9.4).

Comparing actual data with those of the previous decade, one observes that the number of scientists and engineers engaged in R & D in most countries was growing faster or equally fast as in the 1970's: in Bulgaria, Canada, Cyprus, Czechoslovakia, Denmark, Finland, the FRG, the GDR, Ireland, Israel, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, the USSR, the United States of America and Yugoslavia, but some other countries like Greece, Hungary, Malta, Poland and Turkey have shown a decrease.

According to Unesco estimates, 5.7% of the scientific manpower potential in the Europe Region was engaged in R & D activities in 1980, (the world average being 4.7%). Unfortunately, no such estimates are available for more recent years. From the few data available for each country it can be concluded

Table 8.6.

Scientists and engineers engaged in R & D; Europe Region: 1970, 1975, 1980 and 1985

Country	(ca) 1970	(ca) 1975	(ca) 1980	(ca) 1985
Austria	3894	5398	6712(j)	. . .
Belgium	10070(a)	13887	. . .	. . .
Bulgaria	22452	30963	38706	48008
Canada	*20425	16505	26200(i)	37953
Cyprus	110	. . .	45	51(m
Czechoslovakia	36927	44508	53659	61046
Denmark	*5579	5357(f)	6011(i)	8567
Finland	3602(a)	7503	8404(i)	10951(l)
France	*58740	65643	72889(i)	102300
Germany, Fed. Rep. of	82000	103857	120790(i)	133114(l)
German Dem. Rep.	. . .	90836	118500	128502
Greece	1032(a)	2569(f)	2634(i)	2441(l)
Hungary	16282	22588	25589	22479
Iceland	126	215	304(i)	. . .
Ireland	1549(a)	2545	2620(i)	3626(m)
Israel	2800	3350(e)	14722(h)	39749(m)
Italy	29304	37925	46999	63759
Malta	23(a)	39(d)	34(j)	34
Netherlands	22670	23750	26430	33620
Norway	4348	5930	7427	9692
Poland	59000	101000	93300	56600
Portugal	2187(b)	1749(f)	2663	3475(m)
Romania	18711	26107(d)	. . .	. . .
Spain	5842	7924(d)	13457(i)	16215
Sweden	7537(a)	14993	14766(i)	21202
Switzerland	*14396(b)	16230	16410(i)	13350(l)
Turkey	. . .	8910	7309(k)	7747(l)
USSR	927709	1223400	1373300	1491300
United Kingdom	77086(c)	79300	86500(h)	. . .
United States	549400	532700	637300	. . .
Yugoslavia	15118	18200	22951	30546

Source: *Unesco Statistical Yearbook*, 1985, 1986, 1987.

Notes: (a): 1969; (b): 1971; (c): 1972; (d): 1973; (e): 1974; (f): 1976; (g): 1977; (h): 1978; (i): 1979; (j): 1981; (k): 1982; (l): 1983; (m): 1984.

that there is great diversity from one country to another regarding this figure: e.g. from 2—3% in Spain, to 4—5% in Hungary, the Netherlands, Poland, Switzerland and Yugoslavia, or 10—15% in Bulgaria, Czechoslovakia and the USSR, while in the United States of America it rises to approximately 20%.

However, for all countries for which data are available and probably for the whole of the Europe Region, a decline tendency in the share of scientists and engineers engaged in R &D within the total scientific manpower potential is evident.

This tendency is a result of the impact of the scientific-technical revolution on the organisation of production and on the level of qualification of the labour force. To a great extent, the new technological processes require highly qualified personnel (i.e. engineers). The emergence of secure working places with high incomes attracts graduates of higher education institutions to various industries.

This polarisation should also be compared with the more tenuous prospects of a research career, as well as with the usual procedure of employing graduates in R & D with the aim of solving concrete problems without, however, offering them a secure, long-term job.

The comparison between the number of scientists and engineers and the personnel engaged in R & D (see Table 8.7.) divides the countries of the Europe Region into the following groups:

Table 8.7

Share of scientists and engineers (%) in total personnel engaged in R & D; Europe Region: 1970, 1975, 1980 and 1985

Country	(ca) 1970	(ca) 1975	(ca) 1980	(ca) 1985
Austria	36.3	35.0	36.1(f)	. . .
Belgium	25.1(a)	24.4	. . .	. . .
Bulgaria	48.1	50.8	53.5	53.2
Canada	*39.1	38.9	*43.2	48.5(h)
Cyprus	25.6	. . .	37.2	39.3(h)
Czechoslovakia	26.8	29.9	31.2	33.8
Denmark	39.0	37.2	39.4(e)	42.3(g)
Finland	46.6(a)	50.3	52.6(e)	46.5(g)
France	29.1	29.7	31.6(e)	37.5
Germany, Fed. Rep. of	*30.4	34.2	34.0(e)	35.6(g)
German Dem. Rep.	. . .	57.3	62.7	64.8
Greece	41.8(a)	48.1(c)	61.1(e)	50.1(g)
Hungary	30.2	37.3	40.7	46.1
Iceland	49.2	42.2	49.5(e)	. . .
Ireland	40.3(a)	46.9	42.6(e)	58.5(h)
Italy	36.6	40.1	49.1	55.9(g)
Malta	. . .	. . .	73.9(f)	73.9
Netherlands	41.5	43.7	49.3	53.6(h)
Norway	44.0	45.0	49.5	51.1(h)
Poland	30.1	33.8	38.8	31.3
Portugal	. . .	26.0(c)	34.5	37.5(h)
Romania	40.3	. . .	. . .	. . .
Spain	36.1	24.3(c)	44.6(e)	44.9(h)
Sweden	30.1(a)	37.4	40.5(e)	40.0(g)
Switzerland	78.3	56.9	43.2(e)	. . .
USSR	30.9	32.2	31.2	. . .
United Kingdom	29.8(b)	30.6	33.1(d)	. . .
United States	70.8	. . .	. . .	. . .
Yugoslavia	41.5	40.9	42.7	44.6

Source: Computed from *Unesco Statistical Yearbook*, 1985, 1986, 1987.
Notes: (a): 1969; (b): 1972; (c): 1976; (d): 1978; (e) 1979; (f): 1981; (g): 1983; (h): 1984.

(a) countries with less than 40% scientists and engineers, which implies numerous auxiliary personnel: Austria, Belgium, Cyprus, Czechoslovakia, France, the FRG, Portugal, Sweden, the United Kingdom and the USSR;

(b) countries between 40 and 60% scientists and engineers: Bulgaria, Canada, Denmark, Finland, Greece, Hungary, Iceland, Ireland, Italy, the Netherlands, Norway, Poland, Romania, Spain, Switzerland, Turkey and Yugoslavia;

(c) countries with over 60% scientists and engineers, which implies a reduced level of auxiliary personnel: the GDR, Malta and the United States of America.

No comparable data are availiable for the other countries.

Excluding some fluctuations, it can be said that, on the whole, the proportion of scientists and engineers in the total personnel engaged in R & D activities increased during the period 1970—1985. Only in Switzerland there was a decrease. In Greece the proportion grew until 1980, but subsequently decreased. For Austria and Iceland it can be observed that a constant level was maintained.

Another picture of the development in the number of scientists and engineers engaged in R & D is obtained by the calculation of the number of scientists and engineers per 10,000 inhabitants. The results of this calculation are given in Table 8.8.

Table 8.8.

Scientists and engineers engaged in R & D per 10,000 inhabitants; Europe Region: 1970, 1975, 1980 and 1985

Country	1970	1975	1980	(ca) 1985
Austria	5.3	7.2	8.7	. . .
Belgium	11.1	13.7	14.7	. . .
Bulgaria	24.4	35.5	43.7	52.9
Canada	9.6	7.2	11.5	14.5(c)
Cyprus	1.7	. . .	. . .	0.8(c)
Czechoslovakia	25.8	30.1	35.0	39.2
Denmark	11.3	10.2	11.8	14.7(b)
Finland	10.0	15.9	18.7	48.2
France	11.6	12.4	14.0	18.7
German Dem. Rep.	. . .	42.0	67.4	76.6
Germany, Fed. Rep. of	13.8	16.8	20.4	21.8(b)
Greece	2.1	2.0	2.8	2.5(b)
Hungary	15.8	21.4	23.9	21.0
Iceland	6.3	10.5	14.2	. . .
Ireland	5.8	8.1	7.7	10.2(c)
Israel	9.6	17.6	57.8	95.3(c)
Italy	5.5	6.8	8.2	11.0(b)
Malta	0.7	1.1	0.9	0.9
Netherlands	15.6	17.4	18.7	21.7
Norway	11.2	14.8	18.2	21.7(c)
Poland	18.2	29.7	26.2	15.2
Portugal	2.4	2.0	2.7	3.4(c)
Romania	14.3	17.4(a)	. . .	. . .
Spain	1.7	2.0	3.1	4.0(c)
Sweden	10.9	20.3	19.8	22.9(b)
Switzerland	21.7	25.3	25.8	21.0(b)
Turkey	1.9	2.3	2.2	1.6(b)
USSR	38.9	48.1	51.7	53.5
United Kingdom	13.5	14.2	16.3	. . .
United States	25.7	25.0	28.0	31.1(b)
Yugoslavia	7.4	9.1	10.3	13.2

Source: Computed from *Unesco Statistical Yearbook*, 1985, 1986, 1987:
Notes: (a): 1973; (b): 1983; (c): 1984.

In 1970, the number of scientists and engineers engaged in R & D per 10,000 inhabitants varied between 0.7 and 38.9. In the following countries the number was below 10: Austria, Canada, Cyprus, Greece, Iceland, Ireland, Israel, Italy, Malta, Portugal, Spain, Turkey and Yugoslavia. A figure between 10 and 20 was registered by: Belgium, Denmark, Finland, France, the FRG, Hungary, the Netherlands, Norway, Poland, Romania, Sweden and the United Kingdom. Between 20 and 30 was registered in Bulgaria, Czechoslovakia, Switzerland and the United States of America. Only the USSR had a score above 30 (38.9).

Generally it can be said that the number of scientists and engineers engaged in R & D per 10,000 inhabitants grew in all countries during the period 1970—1980. For some countries like Iceland and Israel the multiplication factor was above 2.

Since 1980 the growth has continued for most countries, but not for Cyprus, Greece, Hungary, Poland, Switzerland and Turkey.

On the basis of the last known figures, the following countries have still less than 10 scientists and engineers engaged in R & D activities per 10,000 inhabitants: Cyprus, Greece, Malta, Portugal, Spain, and Turkey (5 countries less than in 1970).

Between 10 and 20 is now registered for Belgium, Canada, Denmark, France, Iceland, Ireland, Italy, Poland, the United Kingdom and Yugoslavia (one country less than in 1970).

Two more countries than in 1970 register figures between 20 and 30: the FRG, Hungary, the Netherlands, Norway, Sweden and Switzerland.

In 1970 only one country registered a figure above 30 (namely the USSR with 38.9). However, the most recent results show that 7 countries register more than 30: between 30 and 40 in Czechoslovakia and the United States of America; between 40 and 50 in Finland; between 50 and 60 in Bulgaria and in the USSR The GDR and Israel also register figures of 76.0 and 95.3 respectively.

Thus, it can be stated that the distribution of countries according to the numer of scientists and engineers in R & D per 10,000 inhabitants in the Europe Region is subject to a radical change, as the number and share of countries having a high number of personnel engaged in R & D increases.

8.4 Scientists and engineers in R & D by field of study

The fields of study indicate the educational background of scientists and engineers engaged in R & D activities, and are thus correlated with the following groups of programmes of the International Standard Classification of Education (ISCED):

- — Natural sciences;
- — Engineering and technology;
- — Medical sciences;
- — Agricultural sciences;
- — Social sciences and humanities;
- — Other fields.

The number of scientists and engineers by field of study is sometimes expressed in FTE's, sometimes in PT and FT. This is why the absolute data are not always strictly comparable.

In Table 8.9. percentage distributions are only given for those countries for which two sets of data, following the same criteria are available, of which one set relates to the period 1980—1985. The nine countries in table 8.9. show a different course of development in the percentage distributions for the period 1970—1985.

The category "other fields" is problematic. For Bulgaria, for instance, this category is used in all observations and therefore scores highest (42—44%). Only in the preceding 1980 did Finland use "other fields" in their registrations, while in the cases of Denmark, Hungary and Portugal this category was used only in the most recent observations.

Apart from the category "other fields", the highest figure was recorded for the category "engineering and technology" (but not in the cases of Denmark, Malta and Portugal). For half of the countries, the field "natural sciences" took second place, for the other countries this was taken by the field "social sciences and humanities".

For practically all countries "medical sciences" was the fourth category and "agricultural sciences" the last.

A general characteristic of the distribution of the percentage of scientists and engineers engaged in R & D by field of study is the relative stability of structures throughout the 15 years under analysis. Although the position of a certain field of study has risen or fallen by several percentage points, the succession of the research domains has not changed. Spain, however, is an exception where "social sciences and humanities" have tripled their share in the total of research fields, and which at present is higher than that of natural sciences.

Subject to comparison, the distribution of scientists and engineers engaged in R & D by field of study within the Europe Region registers particular compatibility in the structure of the R & D systems within the different countries, as well as a common concern for the development of science and its technological application.

8.5 Scientists and engineers in R & D by sector of performance

The sectors of performance identify those areas of the economy in which R & D work is performed. The term "sector of performance" distinguishes the execution of the performance of R & D activities from their financing. Three major sectors of performance can be distinguished:

a) *the productive sector:* being measured at two levels, i.e. R & D "integrated" and R & D "non-integrated" with production, the productive sector thus covers industrial and trading establishments which produce and distribute goods and services for sale;

b) *the higher education sector:* relating to establishments of education at the third level and also including those research institutes, experimental stations, etc. serving them;

c) *the general service sector:* including various public or government establishments serving the community as a whole.

In Table 8.10. the percentage distributions of scientists and engineers engaged in R & D by sector of performance are calculated for those countries of the Europe Region which have submitted at least two complete

Table 8.9.

Scientists and engineers in R & D by field of study 1970, 1975, 1980, 1985

Country	Type of data	Year	Total (=100)	Field of study (%)					
				Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences and humanities	Other fields
Bulgaria	FTE	1975	100	11	19	11	6	12	40
	FTE	1980	100	10	20	12	5	11	42
	FTE	1985	100	9	21	9	4	12	—
Denmark	FTE	1970	100	26	13	21	16	24	—
	FTE	1975(c)	100	20	38	14	10	19	—
	FTE	1980(f)	100	17	9	14	7	20	33
Finland	FTE	1970(a)	100	21	32	6	7	16	19
	FTE	1975	100	21	25	7	6	21	21
	FTE	1980(f)	100	24	42	7	6	21	1
	FTE	1983	100	20	48	8	5	18	—
Hungary	FT+PT	1970	100	14	51	11	8	16	—
	FT+PT	1975	100	13	48	10	9	19	—
	FT+PT	1982	100	10	49	9	8	23	1
Malta	FTE	1975(c)	100	26	3	26	—	46	—
	FTE	1981	100	9	21	29	—	41	—
	FTE	1983	100	9	21	29	—	41	—
Norway	FTE	1975	100	13	50	11	7	19	—
	FTE	1981	100	18	46	11	6	20	—
	FTE	1983	100	17	48	10	5	20	—
Poland	FTE	1970	100	8	73	6	9	4	—
	FTE	1975	100	8	75	5	7	6	—
	FTE	1980	100	11	69	6	6	8	—
	FTE	1985	100	14	58	10	9	9	—
Portugal	FTE	1970(b)	100	29	19	18	19	15	—
	FTE	1975(e)	100	27	26	11	20	15	—
	FTE	1980	100	30	16	9	14	16	14
Spain	FTE	1970	100	28	38	17	9	8	—
	FTE	1975(d)	100	18	48	14	8	12	—
	FTE	1981	100	17	36	15	11	22	—
	FTE	1984	100	17	35	16	9	23	—

Source: Computed from *Unesco Statistical Yearbook*, 1985, 1986, 1987.
Notes: (a): 1971; (b): 1972; (c): 1973; (d): 1974; (e): 1976; (f): 1979.

sets of data, one of these being in the period 1980—1985. The data included in Table 8.10. show evidence of a great variety of distribution by sectors of performance.

According to the most recent data available, the most balanced distribution in the three performance sectors is registered in Yugoslavia (in 1985: 39% in the productive sector, 30% in higher education and 31% in the general service sector, although here too the productive sector ranks first).

For the majority of countries in the Europe Region the productive sector is predominant, registering a characteristic share of over 40%: Austria (43), Bulgaria (53), Canada (52), Finland (43), France (46), the FRG (62), Hungary (57), the Netherlands (47), Norway (47), Poland (49), Sweden (54), Switzerland (67). Two other countries are included in the same group, where the productive sector by far dominates the R & D activities: Czechoslovakia (73) and the United States of America (74).

A characteristic of another, smaller group is the reduced share of the productive sector, which encompasses between 20 and 40% of the total number of scientists and engineers engaged in R & D activities: Denmark (38), Ireland (24), Italy (39), Portugal (23), Spain (26) and, of course, Yugoslavia (39). In the majority of countries included in this group the leading performance sector is that of higher education. Thus, the higher education sector has a share of over 50% in: Ireland (57), Italy (51), Portugal (51) and Spain (55). In other remaining countries of the Region higher education is, in general, the second sector of performance. Mention must be made of the special position held by the higher education sector in R & D activities in two countries in which it holds a share of less than 20%, namely the United States of America (14%) and Czechoslovakia (5%). With the exception of Czechoslovakia, in all the countries of the Europe Region the general service sector ranks third among the performance sectors.

Comparing the share of the productive sector at the beginning and at the end of the period 1970—1985, the following points can be made:

a) A strong growth rate can be noticed in Bulgaria, Canada, Norway and Portugal (10 per cent or more).

b) In some countries there was only a slight relative growth rate in the productive sector: Austria, Ireland, Spain, Switzerland and the United States of America (2 or 3%).

c) For other countries the share remained almost the same: Czechoslovakia, Italy and Sweden.

d) A decrease of 2 to 10% is seen in: Denmark, Finland, France, the FRG, Hungary and the Netherlands.

e) In Yugoslavia the decrease is 13 and in Poland 26%.

The general picture of these developments is not consistent: sometimes it charts a straight line, in other cases it undulates.

The higher education sector reflects a different picture for the various countries:

a) In some countries there was a decrease in the share of this sector from 2 to 10%: Austria, Bulgaria, Norway and Switzerland. A relatively higher decrease was registered for Canada (—15%).

b) Czechoslovakia and France remained at the same level of growth.

Table 8.10.

Scientists and engineers engaged in R & D by sector of performance; 1970, 1975, 1980 and (ca) 1985

Country	Year	All sectors (=100)	Sector of performance (%)		
			Productive sector	Higher education	General service
1	2	3	4	5	6
Austria	1970	100	40	47	13
	1975	100	39	48	13
	1981	100	43	45	12
Bulgaria	1970	100	42	28	30
	1980	100	51	28	21
	1984	100	53	26	21
Canada	1970	100	35	38	27
	1975(f)	100	39	30	31
	1980	100	42	29	29
	1985	100	53	23	24
Czechoslovakia	1970	100	72	6	22
	1975	100	74	6	21
	1980	100	75	5	20
	1985	100	73	5	22
Denmark	1970	100	43	30	27
	1975	100	30	42	28
	1980(g)	100	33	40	27
	1985	100	40	35	25
Finland	1970(a)	100	47	26	27
	1975	100	38	34	29
	1980	100	39	32	29
	1983	100	43	34	23
France	1970	100	48	34	18
	1975	100	47	33	20
	1980(g)	100	46	33	21
	1985	100	43	35	22
Germany, Fed. Rep. of	1970	100	67	18	15
	1975	100	59	25	17
	1980(g)	100	60	24	16
	1983	100	62	23	16
Hungary	1970	100	61	17	22
	1975	100	58	17	25
	1980	100	59	19	22
	1985	100	57	21	22
Ireland	1970(a)	100	22	38	40
	1975	100	17	46	37
	1980	100	20	53	27
	1984	100	24	57	20

Table 8.10. (continued)

1	2	3	4	5	6
Italy	1970	100	39	42	19
	1975	100	36	48	16
	1980	100	45	44	11
	1985	100	45	44	11
Netherlands	1970	100	52	20	27
	1975	100	49	24	27
	1980	100	48	23	29
	1985	100	49	23	28
Norway	1970	100	36	41	22
	1975	100	37	40	23
	1980	100	41	39	20
	1985	100	50	32	18
Poland	1970	100	75	14	11
	1975	100	77	13	9
	1980	100	70	18	11
	1985	100	49	31	20
Portugal	1970(b)	100	13	29	58
	1975(d)	100	14	43	43
	1980	100	17	52	31
	1984	100	23	51	26
Spain	1970	100	23	21	56
	1975(c)	100	33	29	38
	1981	100	22	52	25
	1985	100	30	54	16
Sweden	1970(a)	100	54	30	16
	1975	100	49	38	13
	1980(g)	100	57	24	12
	1985	100	54	39	7
Switzerland	1970(a)	100	64	30	7
	1975	100	65	29	6
	1980(g)	100	67	26	7
United States	1970	100	68	15	17
	1975	100	67	16	17
	1980	100	70	15	15
	1983	100	74	14	13
Yugoslavia	1970	100	52	26	22
	1975	100	51	27	22
	1980	100	38	30	32
	1985	100	39	30	31

Source: Computed from *Unesco Statistical Yearbook*, 1985, 1986, 1987.
Notes: (a): 1969; (b): 1972; (c): 1974; (d): 1976; (f): 1978; (g): 1979.

c) A slight growth (2 to 10%) is observed in Denmark, Finland, the FRG, Hungary, Italy, the Netherlands, Sweden, the United States of America and Yugoslavia.

d) With over 15 percentage points the "big growers" were: Ireland (19), Poland (17), Portugal (22) and Spain (24).

The percentage of scientists and engineers engaged in the general service sector in R & D activities decreased more than 20% for Ireland, Portugal and Spain. A slight decrease of 2 to 10% is observed in Bulgaria, Canada, Finland, Italy, Norway, Sweden and the United States of America. The percentage remained almost the same in Austria, Czechoslovakia, Denmark, the FRG, Hungary and Switzrland. A small growth (2 to 10%) can be noticed in France, the Netherlands, Poland and Yugoslavia.

8.6 The higher education sector engaged in R & D

In the last paragraphs of chapter 8.5 we analysed the total number of scientists and engineers engaged in R & D and employed within the higher education sector.

All the data concerning the number (see Table 8.11.) and percentage (Table 8.10.) of scientists and engineers in the higher education sector must be interpreted with caution. The main reason for this is the problem of distinguishing R & D from the functions of teacing, administration and sometimes patient care, as these are all performed by the same people within the same institutions. At the present time different methods are employed in the compilation of statistical surveys relating to national higher education systems. Methods as well as results differ; the effects on international comparability are still unsatisfactory.

In many countries, e.g. in Austria, Finland, Ireland, the Netherlands and in Norway, directed time studies were undertaken in order to identify the share held by R & D in the total working time of university staff as distinguished from their other functions, to calculate the number of personnel in full-time equivalent and furthermore to use this information for expenditure estimates. Some countries reveal in their R & D statistics that the ordinary university budgets allocated to staff are roughly broken down as follows: 70% for teaching activities and 30% for R & D activities, while other countries estimate that the teaching and scientific research staff devote half of their time to teaching and the other half to research.

Specific methodological problems are one of the choices of the "list of activities" proposed to respondents, problems of non-response, as well as borderline problems in the context of R & D-related activities also feature.

Methods other than directed time studies to assess R & D data for the higher education sector are: (a) collecting R & D data at the institutional level and (b) making broad R & D estimates by applying various kinds of coefficients to other available data series. Whereas the first method has been applied by Belgium, the FRG, Italy, Portugal and the United States of America, the latter has been used in the cases of Canada, France and Spain.

Because of the issues raised above, some further information can be used to obtain a new "hypothetical total number" of scientists and engineers engaged in R & D indicating the "science potential" of a given country. This hypothetical

Table 8.11.

Number of scientists and engineers in the higher education sector; Europe Region: 1970, 1975, 1980 and 1985

Country	(ca) 1970	(ca) 1975	(ca) 1980	(ca) 1985
Austria	1811	2603	3051(h)	...
Belgium	4607(a)	5862(f)	...	...
Bulgaria	6340	8255	10882	11821(g)
Canada	*7700	7350(f)	*7600(g)	8603
Czechoslovakia	2125	2421	2872	3182
Denmark	*1697	2190(c)	2397(g)	2719(i)
Finland	*926(a)	2524	2719	3773(i)
France	*20160	21459	23888(g)	35700
Germany, Fed. Rep. of	*15000	25617	28955(g)	30600(i)
Greece	313(a)	843(e)	1270(g)	...
Hungary	2783	3888	4955	4678
Iceland	20	...	119(g)	...
Ireland	594(a)	1175	1400	2064(j)
Israel	1330	6000(e)	...	...
Italy	12294	18279	20875	27949
Malta	...	39(c)	34(h)	34
Netherlands	4590	5670	6140	7640
Norway	1787	2390	2871	3167
Poland	8100	13600	17100	17700
Portugal	644(b)	756(e)	1138	1755(j)
Romania	5184	4762(c)	...	...
Spain	1210	2316(d)	7134	8745
Sweden	2249(a)	5200	3500(g)	8200
Switzerland	*4860(k)	4670	4300(g)	...
Turkey	...	7239	...	5660(i)
United States	80000	82600	95200	100000(i)
Yugoslavia	3884	4824	6838	9255

Source: *Unesco Statistical Yearbook*, 1985, 1986, 1987.
Notes: (a): 1969; (b): 1972; (c): 1973; (d): 1974; (e): 1976; (f): 1977; (g): 1979; (h): 1981; (i): 1983; (j): 1984; (k): 1971.

total is calculated by the addition of the total number of scientists and engineers engaged in R & D in the productive and the general service sectors, the teaching staff in universities and equivalent institutions to the full-time equivalent.

Based upon this new information, the potential share of the higher education sector can be computed indicating a hypothetical maximum science contribution of the higher education sector. In most cases this share reaches well over 50 percent with decreasing tendencies during the period 1970—1985 in many cases, especially for Bulgaria, Czechoslovakia and the United States of America. In Norway and Switzerland the actual and hypothetical shares do not differ considerably. It remains, however, an open question to what extent the margins between the actual and hypothetical percentages are due to national differences in the methods of calculating the R & D activities of the higher education sector and to what extent they indicate R & D potentials to be further fulfilled.

Table 8.12. presents the indices (1980 = 100) for countries with at least three sets of data, one of which from the years 1980—1985. Where necessary, the figure for 1970, 1975 and 1980 has been calculated by inter- or extrapolation.

Table 8.12.

Scientists and engineers in higher education; 1970, 1975, 1980 —1985; indices (1980=100)

Country	1970	1975	1980	1981	1982	1983	1984	1985
Austria	61	87	100	103	...	...	...	...
Bulgaria	58	76	100	99	97	104	109	...
Canada	101	95	100	100	104	...	111	...
Czechoslovakia	74	86	100	103	102	104	109	111
Denmark	69	87	100	...	...	110	...	...
Finland	44	93	100	109	...	139	...	...
France	82	88	100	...	...	...	...	...
Germany, Fed. Rep. of	51	86	100	102	...	103	...	...
Greece	28	54	100	...	...	...	...	...
Hungary	56	78	100	87	90	92	93	94
Ireland	50	85	100	98	101	...	150	...
Italy	59	88	100	119	133	155	...	...
Malta	...	115	100	100	100	100	100	100
Netherlands	75	92	100	100	121	121	123	...
Norway	62	83	100	101	102	104	106	...
Poland	47	80	100	103	102	100	102	104
Portugal	43	53	100	...	92	...	127	...
Spain	18	36	100	111	...	116	123	...
Sweden	56	120	100	133	...	137	...	...
Switzerland	93	111	100	...	...	...	...	...
United States	64	86	100	101	104	105	...	...
Yugoslavia	57	75	100	111	116	126	129	135

Source: Computed from *Unesco Statistical Yearbook*, 1985, 1986, 1987.

During the period 1970—1980, in most countries there was a growth in the number of scientists and engineers engaged in R & D in higher education. Comparing 1970 and 1980, the variation is 50 or more indexpoints in the cases of Finland, Greece, Ireland, Poland, Portugal and Spain. A variation of 25 to 49 indexpoints is observed for Austria, Bulgaria, Czechoslovakia, Denmark, the FRG, Hungary, Italy, the Netherlands, Norway, Sweden, the United States of America and Yugoslavia. The "slow growers" (1 to 24 indexpoints) are: France (18) and Switzerland (7). In the case of Canada and Malta there was neither growth nor recession registered.

Since 1980 all countries — with the exception of Hungary and Malta — show an increase. Studying the latest observation in the period 1981—1985 one can notice:

a) a small growth (1 to 10 indexpoints) for Austria, Bulgaria, Denmark, the FRG, Norway, Poland and the United States of America;

b) a moderate increase (between 10 and 20 indexpoints) for Canada and Czechoslovakia;

c) the growth is more than 20% but less than 50% for Finland, the Netherlands, Portugal, Spain, Sweden and Yugoslavia. Ireland records an increase of 50% and Italy 55%, thus registering the highest score.

The scores for Malta remain the same and a decrease is shown for Hungary. No data since 1981 are available for France, Greece and Switzerland.

Comparing the growth tendency characteristic of the first half of this decade (the annual average rate specific to the Europe Region being approximately 3.4%) with the increase registered in 1970 (annual average rate of approximately 5.4%), a decrease in the annual rate of approximately 2 percentagepoints can be observed for the scientists and engineers engaged in R & D and working within the higher education sector.

Given the fact that in the period 1981—1985, the total estimated number of all scientists and engineers engaged in R & D increased in the Europe Region by an annual average of approximately 6.7%, it can be concluded that in the first half of the present decade the share held by the higher education sector in the total number of scientists and engineers engaged in R & D has decreased. In every year of the period 1981—1985, the higher education sector increased by only 0.51% for each 1% increase of the total number of scientists and researchers engaged in R. & D.

The distribution of scientists and engineers from the higher education sector engaged in R & D by fields of science and technology is correlated with the following groups of activities, categorised by ISCED:

- Natural sciences;
- Engineering and technology;
- Medical sciences;
- Agricultural sciences;
- Social sciences and humanities;
- Other fields.

Table 8.13. comprises only 17 countries of the Europe Region which have recorded at least one complete set of data for the years 1980—1985. According to these latest data for each country the following observations can be made:

a) In the field "natural sciences" the extremes are Yugoslavia with 8% and the United States of America with 46%. Bulgaria, Czechoslovakia, Malta, the Netherlands and of course Yugoslavia register less than 20%. Scores between 21 and 30% are registered for Austria, Denmark, Finland, Hungary, Italy, Norway, Poland and Spain. The natural sciences hold a share of over 30% in the FRG, Ireland, Portugal and the United States of America.

b) In the category "enginneering and technology" the difference between the lowest (Norway and Portugal: 11%) and the highest score (Czechoslovakia with 38%) is not so great. This field holds a share of below 20 percent in the following countries: Austria, Denmark, the FRG, Hungary, Ireland, Italy, the Netherlands, Norway, Portugal and Spain. Over 20 but less than 31% is registered for Bulgaria, Finland, Malta and the United States of America. More than 30% is observed in Czechoslovakia, Poland and Yugoslavia.

c) The share of "medical sciences" varies from 13% in Ireland to 29% in Malta. The following countries score below 21%: Denmark, Finland, the FRG, Ireland, Poland, Portugal, Spain, the United States of America and Yugoslavia. A score of over 20% is recorded in: Austria, Bulgaria, Czechoslovakia, Hungary, Italy, Malta, the Netherlands and Norway.

d) For most countries the "agricultural sciences" are the smallest field of study. The extremes are, in this case, Czechoslovakia with 15% and Malta with 0%. The share is over 10% in the following countries: Czechoslovakia, Hungary, Poland and Yugoslavia. Over 5 but less than 11% is recorded in Ireland, Italy, Portugal and the United States of America. The other countries, i.e. Austria, Bulgaria, Denmark, Finland, the FRG, the Netherlands, Norway and Spain have a share of 5% or lower in the field of agricultural sciences.

Table 8.13.

Scientists and engineers in the higher education sector by field of science and technology (latest data for the period 1980—1985)

Country	Year	Total (100 %)	Field of science and technology (%)					
			Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Other fields
Austria	1981	100	28	15	21	3	32	—
Bulgaria	1983	100	16	25	26	4	29	—
Czechoslovakia	1980	100	12	38	21	15	15	—
Denmark	1980(a)	100	30	14	13	5	38	—
Finland	1983	100	26	24	17	3	30	—
Germany, Fed. Rep. of	1983	100	31	19	16	3	31	—
Hungary	1985	100	23	16	21	12	27	—
Ireland	1984	100	34	19	13	7	28	—
Italy	1983	100	29	15	24	10	22	—
Malta	1985	100	9	21	29	—	41	—
Netherlands	1984	100	19	14	23	4	40	—
Norway	1983	100	30	11	21	5	33	—
Poland	1985	100	26	33	18	12	11	—
Portugal	1980	100	44	14	17	6	20	—
Spain	1984	100	23	16	17	4	40	—
United States	1983	100	46	21	16	9	9	—
Yugoslavia	1985	100	8	35	17	12	27	—

Source: Computed from *Unesco Statistical Yearbook*, 1987.
Note: (a): 1979.

e) The field of "social sciences and humanities" varies from 9% in the United States of America to 41% in Malta. In more than half of the observed countries, this category holds the highest share. However, Czechoslovakia, Poland, Portugal and the United States of America have a relatively low percentage (between 9 and 10%). In the 21—30 percentage range the following countries are to be found: Bulgaria, Finland, Hungary, Ireland, Italy and Yugoslavia. A score of over 30% is recorded in Austria, Denmark, the FRG, Malta, the Netherlands, Norway and Spain for the social sciences and humanities.

Comparing 1970 with the latest set of data in the years 1980—1985 (see Statistical Annex 4) one can observe that the share held by the "natural sciences", "medical sciences" and "agricultural sciences" decreased, while that of "engineering and technology" and "social sciences and humanities" increased. The developments between 1970 and 1985 differ for the various countries, although there were no changes of a spectacular nature (apart from the case of Malta).

9. THE EXPENDITURE FOR R & D

In dealing with financial resources devoted to R & D activities, reference is made to two different aggregates:

a) financial appropriations or budget allotment consisting of sums of money, appearing in budget plans and allotted to an R & D activity; they are the formal expression of the will of both public and private institutions to direct a certain amount of money to this purpose (e.g. ante approach);

b) actual expenditure, referring to all payments made by an institution during a given period of time, regardless of the source of funds or of the budget on which the sums were reported (e.g. post approach). When not stated otherwise, this study deals with the actual expenditure on R. & D activities.

9.1 Total expenditure for R & D

Expenditure comprises all actual payments made for the performance of R & D activities by a particular unit or institution in the course of the reference year.

The data presented at international level are calculated on the basis of the intramural expenditure, i.e. all payments actually made during a reference year for the performance of a scientific and technological activity *within* a particular unit, institution or sector of performance, whatever the resource or origin of the funds.

The sum of the intramural expenditures incurred by all the national R & D institutions provides a final aggregate, "Total domestic expenditure on R & D activities".

The total domestic expenditure on R & D activities can be defined as all expenditure made for this purpose in the course of a reference year in institutions and installations established in the national territory, as well as installations physically situated abroad. This study deals with "total domestic expenditure", which is referred to in the text as "expenditure".

Actual expenditure can be divided into "current expenditure" (labour costs and other current costs) and "capital expenditure" (expenditure on major equipment and other capital expenditure).

The data on R & D expenditure are even more difficult to compare internationally than the human resources. In order to avoid the problem 9of applying "appropriate" exchange rates or purchasing power priorities, Unesco collects and publishes the annual overall R & D expenditure f - each country in the national currency at current prices.

This makes international comparisons almost impossible and inappropriate for any given year. Even attempts to analyse the expenditure trends over a period of time must be undertaken with caution since — due to inflation — there is a built-in tendency of increases in nominal terms which do not shed any light as to whether increases in real terms actually occurred. In fact, with the exception of slight ephemeral decreases in the cases of Hungary, Italy and Switzerland, all figures reported paint a "beautiful picture" of permanent increases in the overall national expenditure for R & D over a period of time as expressed in current prices (see Statistical Annex 5) At the same time, there are differences in the use of definitions and methods concerning the aggregation of expenditure in "Total domestical expenditures" and some countries, for example Israel, in the referred period, change their use of definitions in the successive reported years.

However, the growth of total nominal expenditure (in some cases only current expenditure) for R & D in the period 1970—1985 for those countries of the Europe Region which have at least three presented sets of data is based on the use of the same definitións. In Table 9.1. indices, using a base of 1980 = = 100, have been calculated for each country. If there were no data available for 1970, 1975 or 1980, a figure has been calculated by linear interpolation or extrapolation.

All countries register a growth in the expenditure on R & D between 1970 and 1980. In a few countries, this growth is less than fifty index points: Czechoslovakia and the USSR. An increase of between 50 and 75 percent is witnessed for Bulgaria, Canada, Denmark, France, the FRG, Hungary, the Netherlands, Poland, Romaia, Switzerland and the United States of America. The following countries record a score higher than 75 percent: Austria, Finland, Greece, Iceland, Ireland, Norway, Portugal, Spain, Sweden, Turkey, the United Kingdom and Yugoslavia. For the GDR and Italy there are insufficient data available before 1980.

Similarly, from 1980 to the latest sets of data registered in the period 1983—1985, all countries show an increase:

a) less than 26 index points: Czechoslovakia and Hungary;

b) between 26 to 50 percent growth is observed for Denmark, the FRG the GDR, the Netherlands, Switzerland, the United Kingdom, the United, States of America and the USSR;

c) a growth rate of between 50 and 100 percent is recorded for: Austria, Bulgaria, Canada, Greece, Ireland, Romania, Sweden and Turkey;

d) for the other countries the score is recorded at above 100 percent, in some cases far above: Finland (139%), Italy (216%), Norway (123%), Poland (137%), Portugal (175%), Spain (267%) and Yugoslavia (571%).

For France and Iceland no data after 1980 are available.

It is clear that conclusions about the real growth of R & D expenditure cannot be drawn arbitrarily from these figures, because of the (possibly large) influence of the developments around the world of national currencies (inflation/deflation).

Table 9.1.

Total expenditure for R & D in the Europe Region 1970; 1975; 1980 (ca) 1985 — indices 1980=100

Country	1970	1975	1980	(ca) 1985
Austria	20	54	100	154
Bulgaria	37	61	100	173
Canada	31	49	100	186
Czechoslovakia	63	87	100	116
Denmark	29	66	100	192
Finland	17	45	100	239
France	29	52	100	216
Germany, Fed. Rep. of	36	65	100	127(a)
German Dem. Rep.	...	...	100	126
Greece	18	44	100	174(a)
Hungary	35	64	100	113
Iceland	2	19	100	...
Ireland	18	47	100	189(b)
Italy	...	40	100	316
Netherlands	39	70	100	138
Norway	24	55	100	223
Poland	40	87	100	237
Portugal	16	28	100	275(b)
Romania (2)	39	65	100	194
Spain	10	43	100	367
Sweden	22	47	100	166(a)
Switzerland (1)	47	82	100	129(a)
Turkey	3	24	100	160(a)
United Kingdom	21	55	100	129(a)
United States (1)	49	57	100	138(a)
USSR	55	82	100	134
Yugoslavia	10	29	100	671

Source: Computed from *Unesco Statistical Yearbook*, 1985, 1986, 1987 and *Anuarul statistic al R. S. România* (The Statistical Yearbook of the Socialist Republic of Romania), 1986.

Notes: (a):) 1983; (b): 1984
(1): current expenditure
(2): only government funds.

These restrictions are similarly valid when the per capita expenditure in national currencies (see Table 9.2.) is presented instead of total expenditure for R & D.

More information would be necessary in order to make a direct comparison between countries regarding their expenditures for R & D. The conversion of national currencies into a common currency by means of the official exchange rates, for instance, would considerably enhance this study with a deeper force of analysis.

Further information is offered in Table 9.3. Using available data for several countries of the Europe Region, column (1) shows the increase of expenditure for R & D in the period after 1980 (indices: 1980 = 100), and column (2) the changes in the number /distribution of scientists and engineers engaged in these activities. By comparing the two indices specific to every country, column (3) shows the relative value of every work place in R & D becoming more expensive

Table 9.2.

Expenditure for R & D per capita 1970, 1975, 1980, 1985 (in national currency and in percent)

Country	Currency	1970	1975	1980	(ca) 1985	$\frac{\text{(ca) 1985}}{1980} \cdot 100$
Austria	schilling	310,2	803,1	1315,7	*2287,7	174
Bulgaria	leva	12,8	28,6	53,1	76,8	145
Canada	dollar	51,7	75,8	146,2	237,2(b)	162
Czechoslovakia	koruna	825,5	1071,9	1195,5	1367,1	114
Denmark	krone	240,4	463,1	658,0	1165,6(a)	177
Finland	markka	78,9	202,5	442,2	1033,3	234
France	franc	288,1	496,4	908,2	1919,8	211
Germany, Fed. Rep. of	D-Mark	217,9	371,5	584,6	695,7(a)	119
German Dem. Rep.	DDR-Mark	. . .	. . .	449,6	566,3	126
Greece	drachma	71,5	170,0	363,0	620,3(a)	171
Hungary	forint	729,9	1289,8	1984,3	2250,8	113
Iceland	krona	822,5	6600,0	33900,4	. . .	. . .
Ireland	pound	4.1	10,0	21,8	35,2(b)	161
Italy	000 lira	10,3	20,9	50,8	105,4(a)	207
Netherlands	guilder	178,7	325,3	423,1	544.1(b)	129
Norway	krone	226,8	499,6	888,4	1652,5(b)	186
Poland	zloty	520,5	1087,9	1192,9	2699,6	226
Portugal	escudo	78,6	125,4	414,6	1114,3(b)	269
Spain	peseta	164,2	567,2	1490,1	3102,2(b)	208
Sweden	krone	288,7	626,8	1319,2	2184,9(a)	166
Switzerland	franc	294,9	484,2	592,9	730,8(a)	123
Turkey	lire	13,4	153,5	385,1	574,0(a)	149
United Kingdom	pound stg	22,7	38,3	91,4	117,4(a)	128
United States	dollar	128,3	172,5	273,6	376,1(a)	137
USSR	rouble	48,2	68,4	80,2	102,7	128
Yugoslavia	dinar	80,8	234,6	631,3	4089,7	648

Source: *Unesco Statistical Yearbook*, various issues.
Notes: (a): 1983; (b): 1984.

after the year 1980. Excepting Czechoslovakia, the FRG, Malta and the Netherlands, in which the relative level remains relatively constant, all other countries register more or less significant changes in expenditures per scientist and engineer engaged in R & D activity. The exceedingly high amplitude of the increase (from 2% to 404%) draws our attention to the differentiated impact of possible inflationary tendencies and renders further comment superfluous.

Combining the results of the tables 9.1., 9.2. and 9.3., the following points can be underlined:

Between 1980 and (ca) 1985, for most countries the relative growth of the total expenditure on R & D is the highest of all the indicators presented, usually followed by the relative increase of the annual average expenditure on R & D per capita (excluding Bulgaria, the GDR, Iceland and Turkey).

In most countries, the annual average expenditure on R & D, per scientist or engineer, followed a similar pattern, but at a slightly slower rate (see also Statistical Annex 6).

Table 9.3.

Growth of expenditure for R & D per scientist and engineer engaged in R & D activities in the period after 1980 (indices: 1980=100)

Country	Period	Increase of R & D expenditure	Indices of the number of scientists and engineers in R & D	$\frac{1}{2}\cdot 100$
Bulgaria	1981–1985	173	124	140
Canada	1981–1984	170	147	115
Czechoslovakia	1981–1985	116	114	102
Denmark	1980–1983	149	125	119
Finland	1980–1983	171	130	131
Germany, Fed. Rep. of	1980–1983	127	128	99
German Dem. Rep.	1981–1985	126	108	116
Greece	1980–1983	174	93	188
Hungary	1981–1985	113	88	129
Ireland	1980–1984	189	138	137
Italy	1981–1983	159	134	119
Malta	1982–1985	100	100	100
Netherlands	1981–1984	124	119	105
Norway	1981–1984	188	121	156
Poland	1981–1985	237	61	391
Portugal	1981–1984	275	130	211
Spain	1980–1984	213	114	187
Sweden	1980–1983	166	129	128
Switzerland	1980–1983	129	81	159
United States	1981–1983	138	114	121
USSR	1981–1983	122	105	116
Yugoslavia	1981–1985	671	133	504

Source: Computed from *Unesco Statistical Yearbook*, various issues.

9.2 Expenditure for R & D as a percentage of the gross national product

Although presented at an extremely high level of aggregation, the R & D expediture as a percentage of the gross national product (GNP) offers some insight into the dynamics of the past performance of each country and into the future targets for developing R & D activities.

A comparison based on the latest set of data available in the first half of this decade (see Table 9.4.) shows 3 or 4 groups of countries in the Europe Region directing a different share of their GNP to R & D activities, namely:

a) A relatively numerous group with a margin of more than 2 percent including Bulgaria (2.7%), the United States of America (2.6%), Hungary (2.4%), Switzerland and the United Kingdom with around 2.2%, and the Netherlands (2.0%). In addition, the FRG is to be mentioned, showing an increase tending towards 2.5% and also Sweden, whose strong upward trend reached 2.6% in 1983.

Over and above this margin are registered figures for the USSR (4.7%), the GDR (4.1%) and Czechoslovakia (3.9%). It is possible that these calculations may be slightly overevaluated, if methodological observations about the cal-

Table 9.4.

Expenditure for R & D as percentage of GNP; Europe Region; 1970, 1975, 1980, 1985

Country	1970	1975	1980	(ca) 1985	$\frac{(ca)\ 1985}{1980}.100$
Austria	0.7	0.9	1.2(a)	...	...
Bulgaria	1.4	1.9	2.7	2.7	100
Canada	1.3	1.0	1.1	1.4(c)	127
Czechoslovakia	3.6	3.9	3.8	3.9	103
Denmark	1.0	1.1	1.0	1.2(b)	120
Finland	0.8	1.0	1.1	1.5	136
France	1.8	1.8	1.8	...	...
Germany, Fed. Rep. of	1.9	2.2	2.4	2.5(b)	104
German Dem. Rep.	...	...	4.4	4.1	93
Greece	0.2	0.2	0.2	0.2(b)	100
Hungary	2.8	3.4	3.3	2.4	73
Iceland	0.4	0.8	0.8	...	...
Ireland	0.7	0.8	0.8	0.9(c)	113
Italy	1.2	1.0	0.8	1.1(b)	138
Netherlands	2.1	2.1	1.9	2.0(c)	105
Norway	1.1	1.5	1.3	1.6(c)	123
Poland	2.3	2.7	2.3	1.2	52
Portugal	0.4	0.3	0.4	0.4(c)	100
Spain	0.2	0.3	0.4	0.5(c)	125
Sweden	1.5	1.8	2.2	2.6(b)	118
Switzerland	2.1	2.1	2.1	2.2(b)	105
Turkey	0.3	1.0	0.5	0.2(b)	40
United Kingdom	2.3	2.1	2.2	2.2(b)	100
United States	2.7	2.4	2.4	2.6(b)	108
USSR	4.2	4.8	4.6	4.7(b)	102
Yugoslavia	1.1	0·7	0.8	0.8	100

Source: *Unesco Statistical Yearbook*, various issues.
Notes: (a): 1981; (b): 1983; (c): 1984.

culation of R & D expenditure as a percentage of the GNP analysed in this paragraph are taken into account;

b) the margins for another group of countries falls between 1.0 and 2.0% (but less than 2%). These are Austria (1.2%), Canada (1.4%), Denmark (1.2%) Finland (1.5%), France (1.8%), Italy (1.1%), Norway (1.6%) and Poland (1.2%);

c) clearly falling below the 1.0% margin are Iceland (0.8%), Ireland (0.9%) and Yugoslavia (0.8%), while Greece (0.2%), Portugal (0.4%), Spain (0.5%) and Turkey (0.2%) present the smallest relative expenditure on R & D.

The expenditure for R & D expressed as a percentage of the GNP — although very commonly used — is subject to some caveats, however. *Firstly*, it does not take into consideration the fluctuations of the gross national product itself. Thus, this indicator may move up or down as a result of the economic situation within a given country, without any real change in the expenditure on R & D.

Secondly, a more serious problem involves the method of calculation of the gross national product. Most of the socialist countries employ the Material

Product System approach, which results in the Net Material Product (NMP) instead of the GNP as the basis for determining the share of R & D expenditure. Too much space and effort would be entailed if the differences between the Material Product System approach and the System of National Accounts approach were to be explained here. Briefly, the latter approach leads to the calculation of the national product at quite a higher level than the former method. Thus, using a smaller base, the share of national product spent by most of East European countries on R & D might look amazingly high in comparison with the corresponding statistics for the West European countries. In order to arrive at comparable indicators, the GNP should be reduced to about 75% of the officially reported data.

Thirdly, the expenditure for R & D of the West European countries should be increased to include expenditure on the social sciences and humanities, and also to include capital expenditure (costs of construction, equipment investments etc.) which is usually included in the statistical data published by the East European countries.

Such a complicated procedure results in the figures presented in Table 9.5. It would appear that they are of greater informative value than the indicators presented in Table 9.4. Unfortunately, such estimates are lacking for the period after 1980.

Table 9.5.

Total expenditure for R & D as percentage of Net Material Product

Country	1970	1975	1980
Bulgaria	2.1	2.3	2.2
Canada	2.8	2.4	2.6
Czechoslovakia	3.6	3.9	3.9
Denmark	1.6	2.0	2.2
Finland	1.5	1.8	2.0
France	3.9	3.9	4.0
Germany, Fed. Rep. of	3.9	3.9	4.0
German Dem. Rep.	3.9	3.7	3.7
Hungary	1.3	1.6	1.8
Ireland	3.5	3.5	3.5
Netherlands	1.9	2.0	2.1
Norway	1.8	2.3	2.2
Poland	1.8	2.3	2.2
Portugal	0.5	0.5	0.5
Romania	1.1	1.3	1.3
Spain	0.5	0.5	0.5
Sweden	2.7	2.8	2.9
Switzerland	3.9	4.0	4.0
United Kingdom	4.5	3.9	4.0
United States	5.2	4.7	4.9
USSR	4.0	4.8	4.8

Source: *Osnovy Naukovedeniya*, Moscow, Nauka, 1985, p. 216.
Note: East European countries — real statistics, West European countries — net material products and expenditures for R & D estimated according to methodology used in most socialist countries.

As a general rule, derived from data from all the countries of the Region, it can be noticed that the more developed a country is — with a correspondingly strong industrial sector —, the greater its national product is and the more of its profits are allotted to the advancement of scientific research and experimental development. In itself, this greater absolute and relative allotment makes socio-economic progress more consistent.

Assuming that inflation/deflation has remained equal for GNP and for R & D during the studied period, it can be said that more money has been invested in R & D activities between 1970 and 1980 in many countries of the Europe Region. Austria, Bulgaria, Czechoslovakia, Finland, the FRG, Hungary, Iceland, Ireland, Norway, Spain, Sweden, Turkey and the USSR show an increase in the expenditure on R & D as a percentage of the GNP or NMP. A constant level of investment in research and experimental development activities can be observed for Denmark, France, Greece, Poland, Portugal and, Switzerland, and a decrease in the index points can be observed for Canada Italy, the Netherlands, the United Kingdom and Yugoslavia.

After 1980, of those countries showing a growth tendency in the 1970's, only Austria, Czechoslovakia, Finland, the FRG, Ireland, Norway, Spain and Sweden still show an increasing percentage on R & D expenditure of GNP.

Since 1980, an increase can be also observed for Denmark and Switzerland, after a period of investments at a constant level and for Canada, Italy and the Netherlands, after a decrease in investments between 1970 and 1980.

The following countries show no fluctuation from the level of 1980 for the period 1980—1985: Bulgaria and the USSR, after an increase between 1970 and 1980; Greece and Portugal, after a decade without fluctuation; the United Kingdom and Yugoslavia, after a decrease in the 1970's.

In the first half of the present decade, a few countries show a decrease in the percentage of R & D expenditure in their GNP, namely the GDR (no data are available before 1980), Poland, after a decade of stability and Hungary and Turkey, after growth in the 1970's.

9.3 Expenditure for R & D by source of funds

In order to provide a better insight into science policies, the total expenditure for R & D is analysed by source of funds.

The following sources of finance can be distinguished:

a) government funds: this category includes funds provided by the central (federal) State or local authorities and originating from the ordinary or extraordinary budget or from extra budgetary sources; it also covers funds received from public intermediary institutions established and wholly financed by the State;

b) productive enterprise funds and special funds: this category includes funds allotted to R & D activities by institutions classified in the productive sector as productive establishments or enterprises and all sums received from the "Technical and Economic Progress Fund", in countries with a centrally planned economy, and other special funds;

c) foreign funds: this category includes funds received from abroad for national R & D activities, including funds received from international organisations, foreign governments or foreign institutions;

d) other funds: this category includes funds that cannot be classfied under any of the preceding headings, e.g. "own funds", endowments and gifts.

It may be pointed out that the primary aim of the analysis of expenditure by source of funds is to establish the original source of funds, not the intermediary sources. In Table 9.6., the percentage distribution of the expenditure for R & D activities by source of funds is given for countries of the Europe Region with at least two sets of data available for the period 1970—1985, one of which appertaining to the period 1980 to 1985.

Table 9.6.

Expenditure for R & D by source of funds: 1970, 1975, 1980, 1985

Country	Year	All funds (=100)	Source of funds (%)			
			Government funds	Productive enterprise funds and special funds	Foreign funds	Other funds
1	2	3	4	5	6	7
Austria	1970(a)	100	47.8	50.8	0.7	0.8
	1975	100	51.6	47.4	0.4	0.6
	1981	100	46.9	50.2	2.5	0.4
	1985	100	48.8	48.6	2.3	0.4
Bulgaria	1975(g)	100	46.3	53.7	—	—
	1980	100	37.2	62.8	—	—
	1985	100	35.8	64.2	—	—
Canada	1970	100	54.4	29.6	2.4	13.6
	1975	100	46.8	32.8	2.9	17.6
	1980(i)	100	40.5	38.0	3.0	18.4
	1984	100	44.9	38.8	4.2	12.0
Cyprus	1970	100	96.1	—	1.0	2.9
	1984	100	98.8	—	1.2	—
Czechoslovakia	1970(a)	100	45.6	54.2	—	—
	1975	100	42.2	57.8	—	—
	1980	100	40.5	59.5	—	—
	1985	100	40.5	59.5	—	—
Denmark	1970	100	49.9	46.1	0.4	3.5
	1975(f)	100	42.2	57.8	—	—
	1980(i)	100	53.7	44.2	1.6	0.5
	1985	100	46.0	48.9	1.8	3.1
Finland	1970(a)	100	48.8	45.5	0.8	4.9
	1975	100	48.3	49.3	0.9	1.4
	1980(i)	100	42.9	55.1	0.7	1.2
	1981	100	41.2	57.0	1.0	0.8
	1983	100	42.3	55.6	0.9	1.2
France	1970	100	60.5	36.1	2.6	0.6
	1975	100	53.5	42.4	3.7	0.6
	1980(i)	100	51.2	42.9	5.2	0.6
Germany, Fed. Rep. of.	1970	100	46.7	53.3	—	—
	1975	100	46.3	50.1	2.2	1.3
	1980(i)	100	41.6	55.4	1.8	1.1
	1983	100	37.7	59.1	1.1	2.1

Table 9.6. (continued)

1	2	3	4	5	6	7
Hungary	1970	100	33.1	66.9	0.0	—
	1975	100	29.3	70.7	0.0	—
	1080	100	24.1	75.9	0.0	—
	1985	100	20.9	78.6	0.4	—
Ireland	1970	100	48.0	36.4	2.1	13.5
	1975	100	48.2	31.9	3.4	16.4
	1980	100	56.6	35.1	5.9	2.5
	1984	100	48.5	43.3	6.7	1.5
Israel	1970	100	56.1	9.0	34.8	—
	1975	100	63.0	17.1	19.9	—
	1980(h)	100	63.2	29.0	7.9	—
Italy	1970	100	49.4	49.2	1.4	—
	1975	100	41.4	51.0	1.8	5.8
	1980	100	45.3	52.1	2.6	—
	1985	100	51.8	44.7	3.5	—
Malta	1975(d)	100	92.6	—	7.4	—
	1983	100	100.0	—	—	—
	1985	100	100.0	—	—	—
Netherlands	1970	100	39.7	57.5	2.8	—
	1975	100	45.1	49.7	4.4	0.8
	1980	100	48.3	45.2	5.6	1.0
	1985	100	44.1	51.5	2.6	1.4
Norway	1970	100	58.5	36.4	1.7	3.4
	1975	100	59.1	37.0	1.7	2.1
	1980	100	58.6	35.6	1.7	4.2
	1985	100	45.6	50.2	2.1	2.1
Portugal	1970(c)	100	65.9	27.6	0.6	6.0
	1975(f)	100	71.8	20.7	1.1	6.3
	1980	100	66.8	26.6	1.9	4.7
	1984	100	60.2	30.8	2.4	6.6
Spain	1970	100	50.1	44.2	1.0	4.8
	1975(e)	100	40.5	57.4	2.0	0.1
	1980(h)	100	37.8	60.4	1.6	0.2
	1985	100	45.2	49.6	5.0	0.2
Sweden	1970(b)	100	40.9	55.1	1.0	3.0
	1975	100	39.1	57.1	1.7	2.1
	1980(i)	100	38.3	60.4	1.2	0.2
	1985	100	37.1	60.7	1.2	0.8
Switzerland	1970(b)	100	17.9	80.4	0.6	1.1
	1975	100	20.5	78.3	—	1.2
	1980(i)	100	22.6	77.4	—	—
	1983	100	21.9	78.1	—	—
United Kingdom	1970	100	51.7	44.1	3.6	0.6
	1975	100	51.7	40.8	4.9	2.5
	1980(h)	100	47.0	44.2	6.3	2.4
	1983	100	48.9	43.6	5.3	2.2
United States	1970	100	55.8	38.9	—	5.2
	1975(f)	100	50.7	45.7	—	3.6
	1980	100	47.6	48.8	—	3.6
	1983	100	46.9	49.6	—	3.5

Table 9.6. (continued)

1	2	3	4	5	6	7
Yugoslavia	1970	100	29.8	55.5	3.6	11.1
	1975(f)	100	21.7	57.1	1.5	19.7
	1980	100	35.9	52.6	1.1	10.4
	1985	100	29.0	59.6	2.0	9.4

Source: *Unesco Statistical Yearbook*, various issues.
Notes: (a): 1969; (b): 1971; (c): 1972; (d): 1973; (e): 1974; (f): 1976; (g): 1977; (h): 1978; (i): 1979.

From these figures, the following points can be made:

— for most countries the categories "foreign funds" and "other funds" are less important after 1980 (totalling less than 10 percent for both categories); only Canada and Yugoslavia show a higher share in the most recent year. During the period 1970—1985 a decrease in this score can be observed;

— with regard to the other sources of funds, it cannot be said that one particular source is most important in all countries. In some countries, the category "government funds" registers the highest percentage in all recorded years, in other countries the category "productive enterprise funds and special funds" does so, while in a few countries, the category differs from year to year;

— in all East European countries, the money for R & D activities is drawn, in all years, from productive, enterprise funds or special funds. This is also valid for the following West European countries: the FRG, Sweden and Switzerland;

— the category "government funds" proves to be the most important in all years for Canada, Cyprus, Denmark, France, Ireland, Israel, Malta, Norway, Portugal, and the United Kingdom. However, in most of these countries, the data show a decrease in this category, while the share of the category "productive enterprise funds or special funds" is growing;

— during the period 1970—1985, a mixed picture can be observed in Austria Finland, Italy, the Netherlands, Spain and the United States of America. The latest set of data for these countries show the highest percentage to be found in the category "productive enterprise funds and special funds".

A general conclusion can be drawn from this: for more than fifty percent of the countries mentioned above, the category "productive enterprise funds and special funds" is the most important. For practically all other countries, this category has gained more importance over the years of the analysed period.

Given the interest of the productive sector in research of an applied nature, the above-mentioned increase tendency in the share of productive enterprise funds within the total R & D expenditure could be linked to a certain propensity for this kind of research, which ultimately could be detrimental to fundamental research.

9.4 Expenditure for R & D by sector of performance

With reference to the sectors of performance, a new percentage distribution of the total expenditure for R & D activities can be derived. From the information in Table 9.7. the following conclusions can be drawn:

— in most countries, "the productive sector" is the most important sector of performance in all sets of data recorded: in Austria, Bulgaria, Canada, Denmark, Finland, France, the FRG, Hungary, Italy, the Netherlands, Norway,

Table 9.7.

Expenditure for R & D by sector of performance: 1970, 1975, 1980, 1985

Country	Year	All sectors (=100)	Sector of performance (%)		
			Productive sector	Higher education sector	General service sector
Austria	1970(a)	100	54.6	33.2	12.2
	1975	100	50.8	37.4	11.7
	1981	100	55.9	32.8	11.4
Bulgaria	1975(f)	100	59.9	4.2	35.9
	1980	100	76.0	5.5	18.5
	1985	100	63.2	6.5	30.3
Canada	1970	100	36.4	27.4	36.2
	1975	100	40.0	27.8	32.2
	1980(h)	100	42.2	30.2	27.6
	1985	100	51.0	23.3	25.7
Cyprus	1970	100	23	—	77
	1984	100	—	0	100
Denmark	1970	100	46.4	25.2	28.4
	1975(e)	100	49.1	28.6	22.3
	1980(h)	100	51.1	26.2	22.7
	1985	100	55.2	24.4	20.4
Finland	1970(a)	100	48.6	23.9	27.5
	1975	100	52.0	21.4	26.5
	1980(h)	100	54.8	18.3	26.9
	1985	100	69.9	19.1	20.0
France	1970	100	58.8	15.7	25.6
	1975	100	61.4	16.0	22.5
	1980(h)	100	61.3	15.5	23.2
Germany, Fed. Rep. of	1970	100	63.3	19.3	17.4
	1975	100	62.2	20.4	17.4
	1980(i)	100	68.5	16.3	15.2
	1983	100	70.7	15.6	13.7
Greece	1970(a)	100	26.0	15.0	58.0
	1975(f)	100	33.0	7.0	60.0
	1980(i)	100	2.0	14.0	84.0
Hungary	1970	100	75.4	7.4	17.2
	1975	100	70.5	10.3	19.2
	1980	100	68.5	11.4	20.1
	1985	100	68.7	13.1	18.2
Iceland	1970	100	2.3	8.8	88.9
	1975	100	1.0	25.8	73.2
	1980(h)	100	46.5	27.1	26.4
Ireland	1970(a)	100	34.3	15.1	50.6
	1975	100	30.6	16.5	52.9
	1980(h)	100	37.1	18.4	44.6
	1984	100	49.3	17.3	33.4

Table 9.7. (continued)

Israel	1970	100	16.0	65.6	18.4
	1975	100	23.7	58.8	17.6
	1980(g)	100	62.5	29.9	7.6
Italy	1970	100	54.5	24.3	21.2
	1975	100	55.7	21.9	22.4
	1980	100	65.8	16.1	18.0
	1985	100	63.4	19.2	17.4
Netherlands	1970	100	57.1	21.8	21.1
	1975	100	53.6	23.4	23.0
	1980	100	51.6	24.3	24.0
	1985	100	56.2	23.2	20.6
Norway	1970	100	45[illegible]	32.5	21.8
	1975(e)	100	47.3	32.4	20.2
	1980	100	50.8	30.0	19.1
	1985	100	62.7	22.2	15.1
Poland	1970	100	78.7	12.4	8.9
	1975	100	73.2	17.6	9.2
	1980	100	67.4	22.5	10.0
	1985	100	62.3	21.4	16.3
Portugal	1970(c)	100	25.1	14.6	60.4
	1975(e)	100	21.1	17.5	61.4
	1980	100	32.8	19.9	47.3
	1984	100	34.1	24.6	41.3
Spain	1970	100	41.9	3.6	54.5
	1975(e)	100	58.6	5.3	36.1
	1981	100	49.3	17.6	33.0
	1985	100	58.0	16.7	25.3
Switzerland	1975	100	80.0	14.2	5.8
	1980	100	75.5	18.7	5.8
	1983	100	77.5	30.2	5.1
Turkey	1970	100	4.0	13.8	82.1
	1983	100	16.2	55.4	28.4
United Kingdom	1970	100	67.2	7.7	15.1
	1975	100	62.7	8.4	29.0
	1980(g)	100	66.2	9.0	24.7
	1983	100	63.2	11.4	25.4
United States	1970	100	68.0	13.5	18.5
	1975(e)	100	69.1	12.6	18.2
	1980	100	70.5	13.3	16.2
	1983	100	73.0	12.2	14.9
Yugoslavia	1970	100	69.7	7.7	22.6
	1975	100	76.9	4.1	19.9
	1980	100	52.7	23.1	24.2
	1985	100	54.3	19.8	26.0

Source: *Unesco Statistical Yearbook*, various issues.
Notes:i (a): 1969; (b): 1971; (c): 1972; (d): 1973; (e): 1976; (f): 1977; (g): 1978; (h): 1979.

Poland, Sweden, Switzerland, the United Kingdom, the United States of America and Yugoslavia the productive sector holds a greater than 50 percent share of the total expenditure on R & D activities. In more than half of these countries, a growth of the share of the productive sector can be observed. Only in Hungary, the Netherlands, Poland, Switzerland, the United Kingdom and Yugoslavia is there a decrease over the observation period;

— in a few countries, another sector of performance began by being the most important at the beginning of the period, but was finally replaced by the category "productive sector": Iceland, Ireland and Spain (first the general service sector, but in the end the productive sector with a share of 46 to 58 percent) and Israel (first the higher education sector, but in the later 1970's the productive sector with over 62 percent).

— in Cyprus, Greece and Portugal, the general service sector proves to be the most important sector of performance in all observed years;

— in Turkey, the general service sector holds the highest share at the beginning, but in the latest set of data the higher education sector has become more important;

— in some countries in which the productive sector is the most important category according to the latest set of data, the second sector of performance is that of the general service sector, namely in Bulgaria, Canada, Finland, France, Hungary, Ireland, Spain, the United Kingdom, the United States of America and Yugoslavia. In these countries, the higher education sector was the least important sector of performance for R & D activities;

— in Austria, Denmark, the Federal Republic of Germaniy, Iceland, Israel, Italy, the Netherlands, Norway, Poland, Sweden and Switzerland, the higher education sector is the second sector of performance and the general service sector is the third;

— in Cyprus, Greece and Portugal the second sector of performance is the productive sector and the higher education sector the third;

— in Turkey, the general service sector holds a higher share than the productive sector.

With the exception of Turkey, all countries with at least one set of data available for the period 1980—1985 show a relative stability in the percentage distribution of the total expenditure on R & D activities by sector of performance over the last 10—15 years.

Comparing the distribution of scientists and engineers engaged in R & D activities with the distribution of total expenditure, Table 9.8. presents the situation of 17 countries of the Europe Region in the last year of the period 1980—1985. The resulting observations complete the analysis of R & D by sector of performance.

As a rule, the productive sector benefits from a greater influx of capital, the difference between the two shares of this sector being of only 9.0 percentage points in the FRG and 28.7 percentage points in Spain, in favour of the distribution of funds as opposed to the distribution of scientists and engineers. There are two exceptions, in which cases the relation is slightly contrary: Canada (—3.7 percentage points) and the United States of America (—0.5 percentage points).

As a rule, the higher education sector benefits from a better distribution of manpower than of funds, with the result that, in this case, the two distributions by sector of performance show greater human intensity in the R & D acti-

Table 9.8.

Percentage distribution of R & D by sector of performance for scientists and engineers and for expenditure in R & D activities

Country	Year	Reference	All sectors	Sector of performance (%)		
				Productive sector	Higher education	All sectors
Austria	1981	(1)	100	43.0	45.5	11.5
		(2)	100	55.9	32.8	11.4
Bulgaria	1984	(1)	100	52.9	26.2	20.9
		(2)	100	63.2	6.5	30.3
Canada	1984	(1)	100	51.6	23.0	25.4
		(2)	100	47.9	23.9	28.2
Denmark	1983	(1)	100	37.8	36.2	26.0
		(2)	100	54.5	24.2	21.4
Germany, Fed. Rep. of	1983	(1)	100	61.5	23.0	15.5
		(2)	100	76.5	15.6	13.7
Hungary	1985	(1)	100	57.1	20.8	22.1
		(2)	100	68.7	13.1	18.2
Ireland	1984	(1)	100	23.6	56.9	19.5
		(2)	100	49.3	17.3	33.4
Italy	1983	(1)	100	39.0	51.3	9.7
		(2)	100	63.4	19.3	17.3
Netherlands	1984	(1)	100	53.8	24.6	21.6
		(2)	100	53.8	24.6	21.6
Norway	1984	(1)	100	47.0	34.0	19.0
		(2)	100	59.3	23.3	17.4
Poland	1985	(1)	100	49.1	31.3	19.6
		(2)	100	62.3	21.4	16.3
Portugal	1984	(1)	100	23.4	50.5	26.1
		(2)	100	34.1	24.6	41.3
Spain	1984	(1)	100	26.3	54.7	19.0
		(2)	100	55.0	17.5	27.5
Sweden	1983	(1)	100	54.1	37.7	8.1
		(2)	100	65.5	30.2	5.3
Turkey	1983	(1)	100	5.6	73.1	21.3
		(2)	100	16.2	55.4	28.4
United States	1983	(1)	100	73.5	13.7	12.8
		(2)	100	73.0	12.2	14.9
Yugoslavia	1985	(1)	100	38.9	30.3	30.8
		(2)	100	54.3	19.8	26.0

Source: *Unesco Statistical Yearbook*, various issues.
Notes: (1): scientists and engineers in R & D; (2): expenditure for R & D activities.

vities. This also means that in the higher education sector, the R & D expenditure per scientist or engineer is lower than that of the average allotment specific for every country.

The detrimental difference between the share of higher education in total expenditure and the one specific to the number of scientists and engineers engaged in R & D activities varies between 1.5 percentage points in the United States of America, 37.2 percentage points in Spain or 39.6 percentage points in Ireland. Exceptions to this rule are Canada and the Netherlands, in which the two shares are almost equal, but which display a slight tendency towards better funding.

The general service sector is characterised by great diversity of supply: in some cases, greater level of capital intensity is manifest, as is the case in Bulgaria, Canada, Ireland, Italy, Portugal, Spain, Turkey and the United States of America, in others there is a greater level of human intensity, for example in Denmark, the FRG, Hungary, the Netherlads, Norway, Poland, Sweden, and Yugoslavia. Only rarely are the shares equal (in Austria, for instance).

9.5 Expenditure for R & D in the higher education sector

The percentage of R & D expenditure allocated to the higher education sector again illustrates clear differences which exist between the countries of the Europe Region. The information given in column (3) of Table 9.8. reflects the participation of the higher education sector in the total effort of R & D at a national level in the last available data year in the period 1980—1985.

With specific reference to the share of the higher education sector in the total expenditure on R & D activities, the following groups of countries and specific trends can be distinguished over the period under analysis:

a) the proportion allocated to higher education is over 25% in Austria, Iceland, Israel, Sweden, Switzerland and Turkey, which attains the highest level recorded at 55.4% (1983) of the total expenditure on R & D activities. With the exceptions of Austria and Israel the figures show a tendency to increase in the other countries over the 1970—1985 period;

b) a relatively numerous group of countries registers figures of up to 25%: Canada, Denmark, Finland, France, the FRG, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Spain and Yugoslavia. Although the development is subject to change, it can be noticed that in 6 of these countries (Ireland, the Netherlands, Poland, Portugal, Spain and Yugoslavia) the share allocated to the higher education sector is on the increase, in France it remains at a constant level of about 15—16%, while in the other 6 countries, the share of the sector under discussion is on the decrease (Canada, Denmark, Finland, the FRG, Italy and Norway);

c) a figure of up to 15% is registered in Bulgaria, Czechoslovakia, Greece, Hungary, Romania, the United Kingdom and the United States of America. In all of the above-mentioned countries, a tendency to increase is apparent, with the exception of the United States of America.

As pointed out in the previous paragraph, with rare exceptions (for example Canada and the Netherlands, in 1984), the higher education sector is characterised by more modest funding related to the number of university staff within the total number of scientists and engineers engaged in R & D activities.

Considering the relation between R & D and socio-economic progress in general, and furthermore, the fact that a large amount of R & D activities in the higher education sector concerns fundamental research, this funding policy, characteristic of the Europe Region, has a negative influence on possible research activities and on the efficiency of scientific research within this sector of performance as compared with the other sectors.

As revealed in the recently published report of the Unesco Office of Statistics "Financial Resources for Fundamental Research", the majority of the developed countries devote between 10% and 30% of current expenditure on R & D to fundmental research, but the support for fundamental research has been decreasing since 1975 (with the exceptions of Sweden and Poland). The same report underlines the fact that the share of fundamental research in the productive sector "was not the top priority of this sector of performance". In the general service sector it was found that only 4 countries (Czechoslovakia, the FRG, Poland and Romania) had fundamental research as their main priority.

However, in the majority of the countries studied, fundamental research was found to be the principal R & D activity within the higher education sector in the fields of medical sciences, natural sciences, social sciences, the humanities and "other" fields.

Table 9.9. gives the percentage distributions of the R & D expenditure within the higher education sector by field of science and technology for those countries of the Europe Region which have at least one complete set of data available for the period 1980—1985.

Analysing the data presented in Table 9.9, it is apparent that the percentage distribution over the various fields of science and technology is not the same for all countries.

In seven of the observed countries, the category "natural sciences" is the most important, namely in Finland, the FRG, Ireland, Italy, Norway, Portugal and the United States of America. The category "engineering and technology" is the most important in Hungary and Yugoslavia. In Austria, the prime interest is in "medical sciences". This category is also the highest in the Netherlands except in the most recent year, when "social sciences and humanities" overtook it by only 0.6 percentage points. "Social sciences and humanities" holds the highest share over the recent years in the Netherlands and in Spain.

A stable, second place is taken by "natural sciences" in Austria, Hungary and Spain (except in the first year). The same position is taken by "social sciences and humanities" in Finland, Ireland the Netherlands (except in the more recent observations) and in Portugal. In the FRG, Italy (except in the first year), the Netherlands (only in the most recent year) and in Norway the category "medical sciences" proves to be the second most important priority. In Yugoslavia only, this position is taken by "agricultural sciences".

"Medical sciences" is the third most important category in Finland, Hungary, Portugal, Spain, the United States of America and Yugoslavia. The same position is held by "social sciences and humanities" in Austria, the FRG, Italy and Norway. Third priority is accorded to other categories in Ireland ("engineering and technology") and in the Netherlands ("natural sciences").

In most countries (Austria, Finland, the FRG, Italy, the Netherlands, Norway, Portugal and Spain) the category "engineering and technology" is found in the fourth position. In Ireland "medical sciences", in Yugoslavia "social

Table 9.9.

Expenditure for R & D in the higher education sector by field of science and technology: 1975, 1980, 1985

Country	Year	All fields (=100)	Field of science and technology (%)					
			Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences and the humanities	Other fields
Austria	1975	100	24.2	11.5	37.5	4.2	22.6	—
	1981	100	24.5	11.4	37.1	3.8	23.2	—
Finland	1980(c)	100	20.5	15.2	23.7	3.9	20.8	15.9
	1983	100	26.9	21.9	22.4	2.8	26.0	—
Germany, Fed. Rep. of	1980(c)	100	31.6	19.0	26.7	4.3	18.3	—
	1983	100	31.7	18.8	25.4	5.0	19.1	—
Hungary	1980	100	25.2	39.5	15.3	11.5	8.5	—
	1985	100	22.6	37.5	14.6	14.0	11.3	—
Ireland	1981	100	34.8	17.5	12.6	10.8	24.3	—
	1984	100	32.7	19.9	17.2	5.6	24.5	—
Italy	1975(a)	100	30.6	13.2	22.3	4.8	29.0	—
	1981	100	28.8	15.2	23.6	9.5	23.0	—
	1985	100	29.0	15.0	24.0	10.0	22.0	—
Netherlands	1980	100	23.7	17.0	29.3	4.9	25.2	—
	1984	100	21.6	16.2	28.5	4.7	29.1	—
Norway	1980(c)	100	31.9	9.5	27.0	7.2	24.4	—
	1983	100	29.5	10.8	26.5	6.8	26.4	—
Portugal	1975(a)	100	48.4	19.2	15.5	5.0	11.9	—
	1984	100	35.9	17.2	18.4	8.3	19.7	—
Spain	1975(a)	100	38.1	10.9	17.1	8.2	25.6	—
	1985	100	29.2	17.4	18.6	4.2	30.6	—
United States	1980	100	49.5	18.2	16.7	7.8	5.5	2.3
	1983	100	48.1	19.5	17.3	8.5	4.8	1.8
Yugoslavia	1980	100	8.1	37.2	14.9	22.4	17.4	—
	1985	100	5.0	43.6	15.2	28.2	8.1	—

Source: Computed from *Unesco Statistical Yearbook*, various issues.
Notes: (a): 1976; (b): 1977; (c): 1979.

sciences and humanities", and in Hungary and the United States of America "agricultural sciences" are fourth most important categories.

In all countries — except Hungary, the United States of America and Yugoslavia — the category "agricultural sciences" brings up the rear.

Entries in the category "other fields" have only been made by Finland and the United States of America; but for the United States of America only in the most recent year under analysis.

In general it can be said that the share for "natural sciences", "agricultural sciences" and "other fields" is on the decrease, while the share for "engineering and technology" and "social sciences and humanities" is on the increase. The category "medical sciences" maintains a status quo.

STATISTICAL ANNEXES

1. The economically active manpower in the countries of the Europe Region
2. The stock of qualified manpower in the countries of the Europe Region
3. The share of scientists and engineers engaged in R & D in the scientific manpower potential
4. Scientists and engineers in the higher education sector by field of science and technology
5. Total expenditure for R & D
6. Expenditure for R & D: annual average expenditure per scientist or engineer.

The economically active manpower in the countries of the Europe Region (total); 1970, 1975, 1980—1985

Country	Type of data	1970	1975	1980	1981	1982	1983	1984	1985
Albania	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Andorra	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Austria	ST	846 326(c)	...	...	153 923	...	...	...	...
	EA	543 075(c)	...	...	...	...	...	...	...
Belgium	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Bulgaria	ST	...	...	...	...	...	...	...	...
	EA	549 102(c)	658 576(e)	858 386	906 956	...	931 802	...	...
Canada	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	6 168 675	...	...	...	...
Cyprus	ST	...	...	...	...	...	...	...	...
	EA	*6 650(b)	...	...	...	...	...	...	...
Czechoslovakia	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Denmark	ST	...	...	323 738	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Faero Islands	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Finland	ST	773 369(c)	983 264	1 486 041	...	1 616 621	...	1 748 273	...
	EA	610 515(c)	...	...	...	...	...	...	...
France	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Germany, Fed. Rep. of	ST	1 189 000	4 655 000(h)	11 808 000	...	...	...	...	...
	EA	982 000	3 657 000(h)	8 374 000	...	...	...	...	...

Statistical Annex *(continued)*

Country	Type of data	1970	1975	1980	1981	1982	1983	1984	1985
German Dem. Rep.	ST	...	...	...	...	...	...	...	...
	EA	716 300	1 018 200	1 412 200	1 455 500	1 502 100	1 549 100	1 594 200	1 636 000
Gibraltar	ST	164	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Greece	ST	...	...	...	1 602 088	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Hungary	ST	711 300	819 458(d)	2 134 977	...	...	...	3 221 000	...
	EA	*637 400	...	1 860 086	...	...	...	2 680 550	...
Iceland	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Ireland	ST	*382 073(c)	...	...	1 197 560	...	...	...	...
	EA	258 966(c)	...	...	831 790	...	...	...	...
Israel	ST	...	175 100	...	...	...	...	421 810	...
	EA	*76 000	146 100(e)	...	...	...	...	349 410	...
Italy	ST	4 242 466(c)	...	...	7 496 765	...	...	...	...
	EA	2 542 676(c)	...	...	64 703 361	...	...	...	...
Liechtenstein	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Luxemburg	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Malta	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Monaco	ST	...	...	...	...	3 125	...	...	...
	EA	...	...	...	...	...	...	...	...
Netherlands	ST	*742 000(c)	...	2 832 500(i)	3 287 200	...	3 550 300	...	3 827 300
	EA	*560 000(c)	...	2 304 700(i)	2 660 600	...	2 907 600	...	3 100 300
Norway	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...

Statistical Annex 1 (continued)

Country	Type of data	1970	1975	1980	1981	1982	1983	1984	1985
Poland	ST	3 711 000	4 815 000(e)	649 000(h)	...	...	...	8 260 000	...
	EA	2 302 000	3 883 000(e)	5 088 000(h)	...	...	...	6 264 000	...
Portugal	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Romania	ST	...	...	...	...	...	...	...	...
	EA	627 016	...	...	...	...	...	...	...
San Marino	ST	*514	*592	...	3 178	3 306	3 617	...	4 066
	EA	*408	*508	...	...	2 612	2 458	...	2 804
Spain	ST	...	...	...	5 701 527	...	7 803 700	8 340 800	...
	EA	...	...	...	...	...	4 634 800	5 017 000	...
Sweden	ST	...	...	2 600 500(i)	...	...	...	...	...
	EA	...	...	2 178 400(i)	...	...	...	...	...
Switzerland	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Turkey	ST	...	...	1 538 000	...	...	...	...	...
	EA	443 877	682 336	...	...	...	...	...	...
USSR	ST	...	...	...	...	...	...	...	...
	EA	16 841 000	22 796 300	28 612 000	29 800 000	31 000 000	31 628 000	...	33 592 000
United Kingdom	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
USA	ST	...	...	...	...	...	...	...	...
	EA	...	3 410 000(f)	...	...	...	...	...	...
Yugoslavia	ST	2 393 004	2 938 604(f)	...	5 114 010	...	...	...	...
	EA	1 837 668	2 265 530(f)	3 182 642(h)	4 041 699	...	...	...	...

Source: *Unesco Statistical Yearbook*, various issues.
Notes: (a): 1967; (b): 1969; (c): 1971; (d): 1973; (e): 1974; (f): 1976; (g): 1977; (h): 1978; (i): 1979.
* — estimation
EA — Economically active qualified manpower
ST — Stock of qualified manpower.

The stock of qualified manpower in the countries of the Europe Region; 1970, 1975, 1980—1985

Country	Type of data	1970	1975	1980	1981	1982	1983	1984	1985
Albania	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Andorra	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Austria	ST	118 294(c)	...	...	153 923	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Belgium	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Bulgaria	ST	...	...	...	...	...	...	...	...
	EA	171 311(c)	199 839(f)	274 977	289 802	...	302 809	...	...
Canada	ST	...	...	...	...	...	...	...	...
	EA	537 925(c)	...	...	1 291 210	...	...	...	...
Cyprus	ST	...	...	...	...	...	...	...	...
	EA	*4 650(b)	...	...	...	...	...	...	...
Czechoslovakia	ST	...	...	...	...	...	...	...	...
	EA	277 148	327 772(e)	542 706	...	...	...	...	...
Denmark	ST	...	...	83 529	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Faero Islands	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Finland	ST	170 379(c)	223 527	160 895	...	172 244	...	183 870	...
	EA	135 873(c)	...	...	...	...	...	...	...
France	ST	...	1 522 850	...	...	...	...	...	...
	EA	...	1 251 610	...	...	...	...	...	...

Country	Type of data	1970	1975	1980	1981	1982	1983	1984	1985
Germany, Fed. Rep. of	ST	1 083 000	2 464 000	2 882 000	...	...	...	...	...
	EA	898 000	1 981 000(i)	2 278 000	...	...	...	...	...
German Dem. Rep.	ST	...	...	...	...	...	...	...	...
	EA	261 500	398 900	500 700	517 600	534 700	553 000	571 500	588 800
Gibraltar	ST	41	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Greece	ST	194 828(c)	...	...	329 489	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Hungary	ST	*303 000	336 143(e)	484 846	...	...	...	587 500	...
	EA	*266 500	293 943	412 219	...	...	...	487 300	...
Iceland	ST	3 169	5 024	...	...	...	...	...	...
	EA	3 044	...	...	...	...	...	...	...
Ireland	ST	*67 422	...	...	169 234	...	...	...	...
	EA	*56 420	...	...	139 685	...	...	...	...
Israel	ST	...	96 300(f)	...	...	...	...	205 658	...
	EA	*36 000	82 300(f)	...	...	...	...	174 518	...
Italy	ST	884 813(c)	...	...	1 477 305	...	...	...	...
	EA	557 879(c)	...	...	1 175 418	...	...	...	...
Liechtenstein	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Luxemburg	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Malta	ST	1 751(b)	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Monaco	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Netherlands	ST	*425 000	...	796 500	881 900	...	968 300	...	1 117 400
	EA	*340 000	...	689 000(j)	773 100	...	851 600	...	972 300

Statistical Annex 2 (continued)

Country	Type of data	1970	1975	1980	1981	1982	1983	1984	1985
Norway	ST	51 000	77 400	94 350	97 450	...	...	...	114 830
	EA	...	...	...	...	...	...	...	...
Poland	ST	*606 000	803 000(f)	1 202 000(i)	...	...	...	1 657 000	...
	EA	502 000	733 000(f)	1 075 000(f)	...	...	...	1 423 000	...
Portugal	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
Romania	ST	...	...	...	...	...	...	...	...
	EA	274 541	...	...	...	...	...	...	...
San Marino	ST	*171	*267	...	541	490	517	...	565
	EA	*146	*203	...	394	420	400	...	443
Spain	ST	...	...	...	1 201 861	...	1 580 300	1 627 100	...
	EA	...	...	...	...	...	1 152 000	1 182 500	...
Sweden	ST	...	...	373 100(j)	...	...	...	...	...
	EA	...	...	335 900(j)	...	...	...	...	...
Switzerland	ST	175 090	*254 000	419 956	...	...	...	...	...
	EA	143 640	...	348 167	...	...	...	...	...
Turkey	ST	...	...	708 000	...	...	...	...	...
	EA	219 101	275 015	...	...	...	...	...	...
USSR	ST	...	...	...	...	...	...	...	...
	EA	6 853 000	9 477 000	12 073 000	12 600 000	13 000 000	13 487 000	...	14 485 000
United Kingdom	ST	...	...	...	...	...	...	...	...
	EA	...	...	...	...	...	...	...	...
USA	ST	...	...	...	...	...	...	...	...
	EA	...	2 452 000(g)	2 720 000	3 167 000	3 431 800	...	...	...
Yugoslavia	ST	217 989(d)	285 593(g)	...	520 405	...	...	...	...
	EA	90 442(d)	124 695(g)	326 529(i)	460 688	...	...	...	...

Source: *Unesco Statistical Yearbook*, various issues.

Notes: (a): 1967; (b): 1969; (c): 1971; (d): 1972; (e): 1973; (f): 1974; (g): 1976; (h): 1977; (i): 1978; (j): 1979

* — estimation

EA — Economically active qualified manpower

ST — Stock of qualified manpower.

Statistical Annex 3

The share of scientists and engineers engaged in R & D in the scientific manpower potential (EA=100); 1970, 1975, 1980—1985

Country	1970	1975	1980	1981	1982	1983	1984	1985
Bulgaria	14	15	14	14	...	14	...	...
Czechoslovakia	13	12	10	...	...	...	...	...
FRG	8	6	5	...	...	...	...	...
GDR	...	22	24	23	...	23	22	22
Hungary	5	6	6	...	...	...	5	...
Israel	8	8	...	...	...	...	22	...
Netherlands	5	4	4	4	...	...	...	...
Poland	10	12	9	...	...	...	5	...
Spain	3	...	...	2	...	1	1	...
Switzerland	8	6	5	...	...	...	...	...
USSR	14	13	11	11	11	11	...	10
USA	31	34	23	21	20	...	...	...
Yugoslavia	...	...	6	6	...	...	...	...

Source: Computed from *Unesco Statistical Yearbook*, various issues.

Scientists and engineers in the higher education sector by field of science and technology; 1970, 1975, 1980—1985

Country	Year	Total (= 100)	Field of science and technology (%)					
			Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences and humanities	Other fields
Austria	1970	100	25	14	30	4	27	—
	1975	100	28	14	22	4	33	—
	1981	100	28	15	21	3	32	—
Bulgaria	1975	100	18	28	20	7	28	—
	1980	100	14	26	29	4	27	—
	1981	100	14	27	26	4	28	—
	1982	100	15	28	23	4	30	—
	1983	100	16	25	26	4	29	—
Czechoslovakia	1970	100	11	36	24	12	16	—
	1975	100	13	38	21	14	14	—
	1980	100	12	38	21	15	15	—
Denmark	1975(f)	100	31	13	14	6	37	—
	1980(g)	100	30	14	13	5	38	—
Finland	1970(b)	100	33	20	18	4	25	—
	1975	100	24	15	26	4	30	—
	1980(g)	100	23	19	29	5	24	—
	1981	100	30	17	16	3	34	—
	1983	100	26	24	17	3	30	—
Germany, Fed. Rep. of	1970(b)	100	32	15	27	6	20	—
	1975	100	29	20	19	5	28	—
	1980(g)	100	31	21	16	3	29	—
	1981	100	31	19	16	3	31	—
	1983	100	31	19	16	3	31	—

Country	Year	Total (=100)	Field of science and technology (%)					
			Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences and humanities	Other fields
Hungary	1970(b)	100	28	17	23	12	19	—
	1975	100	25	19	24	13	19	—
	1980	100	29	19	18	12	22	—
	1981	100	23	16	22	12	27	—
	1982	100	23	17	21	12	27	—
	1983	100	23	16	23	12	27	—
	1985	100	23	16	21	12	27	—
Ireland	1970(b)	100	45	11	18	11	15	—
	1975	100	38	11	8	8	35	—
	1980(g)	100	37	12	8	9	35	—
	1981	100	38	11	6	9	35	—
	1982	100	38	11	6	9	35	—
	1984	100	34	19	13	7	28	—
Italy	1970(b)	100	25	12	22	5	36	—
	1975	100	27	13	22	5	34	—
	1981	100	27	13	21	6	33	—
	1982	100	27	13	21	6	33	—
	1983	100	29	15	24	10	22	—
	1985	100	29	15	24	10	22	—
Malta	1975(d)	100	41	3	56	—	—	—
	1981	100	9	21	29	—	41	—
	1983	100	9	21	29	—	41	—
	1985	100	9	21	29	—	41	—
Netherlands	1970(b)	100	28	16	23	4	29	—
	1975	100	24	17	24	4	32	—
	1980	100	22	15	24	3	35	—
	1981	100	22	15	24	3	36	—
	1982	100	20	14	23	4	40	—
	1984	100	19	14	23	4	40	—

Statistical Annex 4 (continued)

Country	Year	Total (= 100)	Field of science and technology (%)					
			Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences and humanities	Other fields
Norway	1970(a)	100	29	13	22	11	24	—
	1975(d)	100	29	12	22	7	31	—
	1980(g)	100	31	10	21	6	32	—
	1981	100	30	10	21	5	33	—
	1983	100	30	11	21	5	33	—
Poland	1975(f)	100	26	38	17	11	9	—
	1980	100	25	37	16	12	9	—
	1981	100	24	36	16	12	11	—
	1982	100	25	35	15	11	13	—
	1983	100	25	35	17	12	12	—
	1985	100	26	33	18	12	11	—
Portugal	1970(c)	100	46	9	31	3	11	—
	1975(f)	100	43	15	17	5	19	—
	1980	100	44	14	17	6	20	—
Spain	1970	100	33	11	26	8	23	—
	1975(e)	100	35	12	15	4	34	—
	1981	100	22	17	18	5	38	—
	1983	100	23	16	17	4	39	—
	1985	100	24	15	12	4	40	—
USA	1970(b)	100	40	18	21	10	10	—
	1975(e)	100	43	19	19	8	10	—
	1980	100	46	21	15	8	10	—
	1982	100	46	20	16	9	9	—
	1983	100	46	21	16	9	9	—
Yugoslavia	1970(c)	100	7	25	21	13	34	—
	1975(e)	100	7	29	20	12	32	—
	1980	100	10	38	18	17	24	—
	1981	100	10	34	18	15	24	—
	1982	100	10	36	13	17	24	—
	1983	100	8	35	18	12	27	—
	1985	100	8	35	17	12	27	—

Source: *Unesco Statistical Yearbook*, various issues.
Notes: (a): 1969; (b): 1971; (c): 1972; (d): 1973; (e): 1974; (f): 1976; (g): 1979.

Total expenditure for R & D; 1970, 1975, 1980—1985; Europe Region (thousands)

Country	Currency	(ca) 1970	(ca) 1975	1980	1981	1982	1983	1984	1985
Albania	...	...	...	...	...	...	...	...	...
Andorra	...	...	...	...	...	...	...	...	...
Austria	schilling	2 286 474	6 039 416	...	12 331 026	13 905 100	14 910 400	16 377 900	*17 371 500
Belgium	franc	7 776 990(c)	25 026 578(e)	...	...	...	...	...	...
Bulgaria	leva	106 415(a)	334 900(g)	470 800	537 000	631 800	669 800	696 900	812 300
Canada	dollar	*1 103 000	1 729 700	2 930 000(i)	*4 085 000	*5 018 000	5 365 000	5 966 000	...
Cyprus	pound	909	...	...	...	...	...	1 173	...
Czechoslovakia	koruna	*11 600 000	15 867 000	18 302 000	18 234 000	18 688 000	19 455 000	19 875 000	21 298 000
Denmark	krone	1 185 230	2 662 800(f)	3 367 100(i)	...	...	5 970 400	...	...
Faero Islands	...	...x	...	...	...	...	...	...	...
Finland	markka	298 630(c)	953 924	1 748 130(i)	2 483 120	...	3 626 730	4 381 000	*5 054 000
France	franc	*14 627 000	26 203 100	44 123 000(i)	...	...	...	...	...
FRG	d-mark	*12 950 000	22 969 000	33 456 000(i)	37 703 000	...	42 513 000	...	...
GDR	ddr-mark	...	...	7 525 000e*	8 202 000*	...	8 165 000	8 750 000*	9 498 000
Gibraltar	...	...	...	...	...	...	...	...	...
Greece	drachma	453 848(c)	1 739 220(f)	2 640 000(i)	...	...	6 067 000	...	...
Holy See	lira	...	1 677 989(f)	— . .	...	...	...	...	...
Hungary	forint	7 525 000	13 594 000	21 258 000	19 425 000	21 215 000	20 419 000	22 686 000	24 077 000
Iceland	krona	*164 500	1 438 800	6 427 500(i)	...	...	...	...	...
Ireland	pound	9 950(c)	31 472	52 266(i)	*77 543	97 582	...	125 691	...
Israel (1)	pound	*309 000	803 000	6 154 300(h)	...	...	...	...	...
Italy (2)	lira	...	1 168 103	2 897 274	4 055 335	4 915 678	4 602 225	...	...
Liechtenstein	...	...	...	...	...	...	...	...	...
Luxemburg	...	...	...	...	...	...	...	...	...
Malta	lira	195(b)	10(e)	...	10	...	10	10	10
Monaco	...	...	...	...	...	...	...	...	...
Netherlands	guilder	2 505 000	4 440 000	6 348 000	6 643 000	7 284 000	7 699 000	7 852 000	...
Norway	krone	879 800	2 002 000	3 629 800	4 213 800	4 952 600	5 690 800	6 825 400	...
Poland	zloty	16 900 000	37 011 200	42 440 400	42 983 000	46 388 400	57 443 700	73 728 300	100 396 900
Portugal	escudo	*751 189(d)	1 279 591(f)	4 118 500	...	6 541 200	...	11 307 600	...
Romania	leu	2 181 390	3 354 196(e)	...	...	...	...	...	...
San Marino	lira	—	—	—	—	—	—	—	...
Spain	peseta	5 547 957	24 963 814(f)	33 278 000(h)	67 126 042	...	100 697 093	118 922 654	...

Statistical Annex 5 (continued)

Country	Currency	(ca) 1970	(ca) 1975	1980	1981	1982	1983	1984	1985
Sweden	krone	*2 726 400(d)	5 133 200	8 611 000(i)	13 320 000	. . .	18 189 000	. . .	. . .
Switzerland (1)	franc	1 966 800(d)	2 977 000	3 611 100	3 789 100	. . .	4 643 000	. . .	. . .
Turkey	lira	400 100(c)	6 466 409(g)	12 572 229(i)	. . .	. . .	27 220 500	. . .	. . .
United Kingdom	pound stg	1 081 879	2 139 000	3 510 300(h)	5 921 200	. . .	6 583 000	. . .	. . .
USA (1)	dollar	*26 286 000	38 581 200(g)	62 284 600	69 844 000	80 524 000	86 204 600	. . .	. . .
USSR	rouble	11 690 000	17 400 000	21 300 000	23 400 000	24 600 000	26 000 000	27 600 000	28 600 000
Yugoslavia	dinar	1 442 600	4 907 000(f)	14 105 000	18 235 000	26 961 000	37 313 000	56 933 000	94 688 000

Source: *Unesco Statistical Yearbook*, various issues.
Notes: — (a): 1967; (b): 1968; (c): 1969; (d): 1971; (e): 1973; (f): 1976; (g): 1977; (h): 1978; (i): 1979
— (1): current expenditure; (2): in millions.

Expenditure for R & D: annual average expenditure per scientist or engineer (in national currency); 1970, 1975, 1980—1985

Country	Currency	1970	1975	1980	1981	1982	1983	1984	1985
Austria	schilling	587 100	1 121 100	1 893 633	1 837 200	...	...	...	...
Bulgaria	leva	9 494	10 024	12 200	13 000	14 777	15 400	15 400	14 500
Canada	dollar	54 000	104 800	127 050	142 300	...	169 700	163 700	...
Czechoslovakia	koruna	323 500	356 498	341 100	339 600	336 900	339 800	337 900	348 900
Denmark	krone	212 400	462 482	560 200	...	...	795 200	...	...
Finland	markka	80 000	127 140	235 350	262 700	...	331 200	400 100	...
France	franc	249 000	399 200	656 825	...	...	...	...	...
FRG	d-mark	157 900	221 605	286 750	299 200	...	319 400	...	...
GDR	ddr-mark	...	...	67 000	67 000	...	64 000	68 600	73 900
Greece	drachma	473 686	643 114	1 372 975	...	...	2 485 000	...	...
Hungary	forint	462 200	601 824	830 700	872 400	965 635	922 600	1 007 500	1 071 100
Iceland	krona	1 305 600	6 283 000	24 858 125	...	...	...	...	...
Ireland	pound	7 000	12 400	25 250	29 400	35 200	...	34 700	...
Italy	lira	18 928 200	30 800 343	61 645 400	77 897 330	86 685 000	95 634 900	...	...
Netherlands	guilder	114 700	186 950	227 900	236 300	241 400	252 200	250 700	...
Norway	krone	305 600	337 605	448 700	...	638 700	...	761 000	...
Poland	zloty	286 400	366 448	454 900	483 000	588 700	765 900	987 000	1 773 800
Portugal	escudo	297 400	645 050	1 546 600	...	2 166 700	...	3 254 000	...
Spain	peseta	949 700	2 980 350	4 959 800	4 669 300	...	7 076 400	7 773 200	...
Sweden	krone	264 450	308 200	659 650	736 100	...	953 300	...	...
Switzerland	franc	136 250	191 251	260 650	...	...	347 800	...	...
USA	dollar	50 000	68 995	97 700	105 700	177 100	120 900	...	...
USSR	rouble	12 600	14 223	15 500	16 600	17 200	18 100	18 900	19 200
Yugoslavia	dinar	108 900	259 454	614 600	732 900	...	...	...	3 098 000

Source: *Unesco Statistical Yearbook*, various issues.

REFERENCES

ALEWELL, K., Research as the Task of University Teachers — Relationship between Research, Teaching, and Training at the Universities. In: *Higher Education and Research,* Bucharest, CEPES, 1986, pp. 48—59.

DICKINSON, J. P., *Sciences et chercheurs scientifiques dans la société moderne.* Paris, Unesco, 1988.

The Future of University Research, Paris. OECD, 1981.

HÜFNER, K., Comparative Survey of the National Policies Regarding the Organisation, Structure and Management of Research inside and outside Higher Education in the Countries of the Europe Region (West European countries, Canada, Israel, and the United States of America). Prepared upon request of CEPES, 1987.

KATZ, M. L.; SHAPIRO, C., R & D Rivalry with Licensing or Invitation. In: *The American Economic Review*, Vol. 77, No. 3, June 1987.

KING, A., *Science and Policy. The International Stimulus.* London, Oxford University Press, 1974.

KWIATKOWSKI, St., Comparative Survey of the National Policies Regarding the Organization, Structure and Management of Research inside and outside Higher Education in the Countries of the Europe Region (East European countries). Prepared upon request of CEPES, 1987.

Manual for Statistics on Scientific and Technological Activities. Paris, Unesco, ST — 84/WS/12.

MAYOR, F., On Human Problems, Research, and Higher Education. In: *Higher Education and Research*, Bucharest, CEPES, 1986, pp. 11—18.

Nauka Polska w latach 1973—1984. Warszawa, GUS, 1985.

NELSON, R. R., Institutions Supporting Technical Advance in Industry. In: *The American Economic Review*, Vol. 76, No. 2, May 1986.

Osnovy naukovedeniya. Moscow, Nauka, 1985.
La science et la technologie en Roumanie. Bucarest, 1981.
Summary Record of the OECD Workshop on Science and Technology Indicators in the Higher Education Sector. Paris, 1986.
VARSAVSKY, A. E.; MINDELI, L. E.; SALTYKOV, B. G., *Nauchnyi potentsial strany*. Moscow, Znanie, 1984.
WILLIAMS, G., The Role of Research in Higher Education Institutions: Some Policy Questions. In: *Higher Education and Research*, Bucharest, CEPES, 1986, pp. 29–34.

Printed by ICECOOP-ILEXIM, Bucharest, Romania